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MONTANA BALD EAGLE MANAGEMENT PLAN

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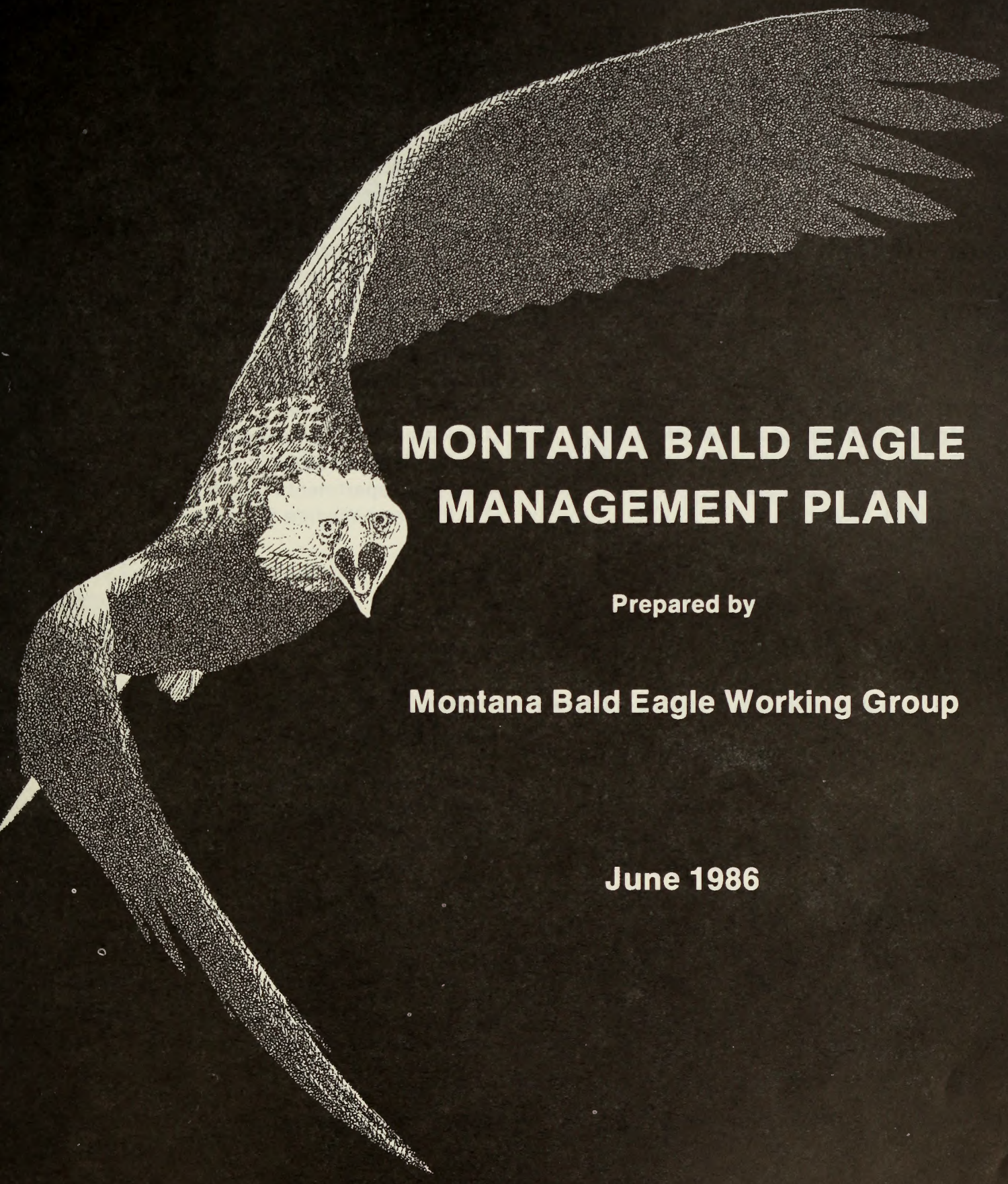

MONTANA BALD EAGLE MANAGEMENT PLAN

Prepared by

Montana Bald Eagle Working Group

June 1986

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ACKNOWLEDGMENTS

While an editorial committee composed of Ron Escano, Dennis Flath, Rob Hazlewood, and Bob Klaver assembled and edited the various sections of this document, it must be recognized that their efforts were only an extension of the work performed by the members of the entire Working Group.

Of particular note are the efforts by Riley and Pat McClelland, Lorin Hicks, Robin Magaddino, Betsy Spettigue, Al Harmata, Carol Taylor, Glen Gray, and Dan Hinckley. Cover design was drawn by Neil Rizos. The bibliography of the Bald Eagle in Montana was prepared by Robin Magaddino.

A special note of thanks goes to Margaret Morelli who typed the many drafts of the plan. Her prowess at the word processor is nonpareil.

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Montana Bald Eagle Management Plan

Executive Summary

The Montana Bald Eagle Working Group is composed of representatives from state and federal agencies, universities, conservation groups, and private industry. The group serves as technical advisor in the research, management, and inventory of bald eagles and bald eagle habitat in Montana.

The objectives of the Montana Bald Eagle Mangement Plan are to:

1) Inform landowners of the past and present status of Montana bald eagles as well as long term management and recovery objectives.

2) Identify potential problems for the Montana population and offer recommendations to avoid conflicts with other land uses.

3) Standardize methods for identifying and mapping habitat, monitoring eagle productivity and use, and completing site-specific management plans.

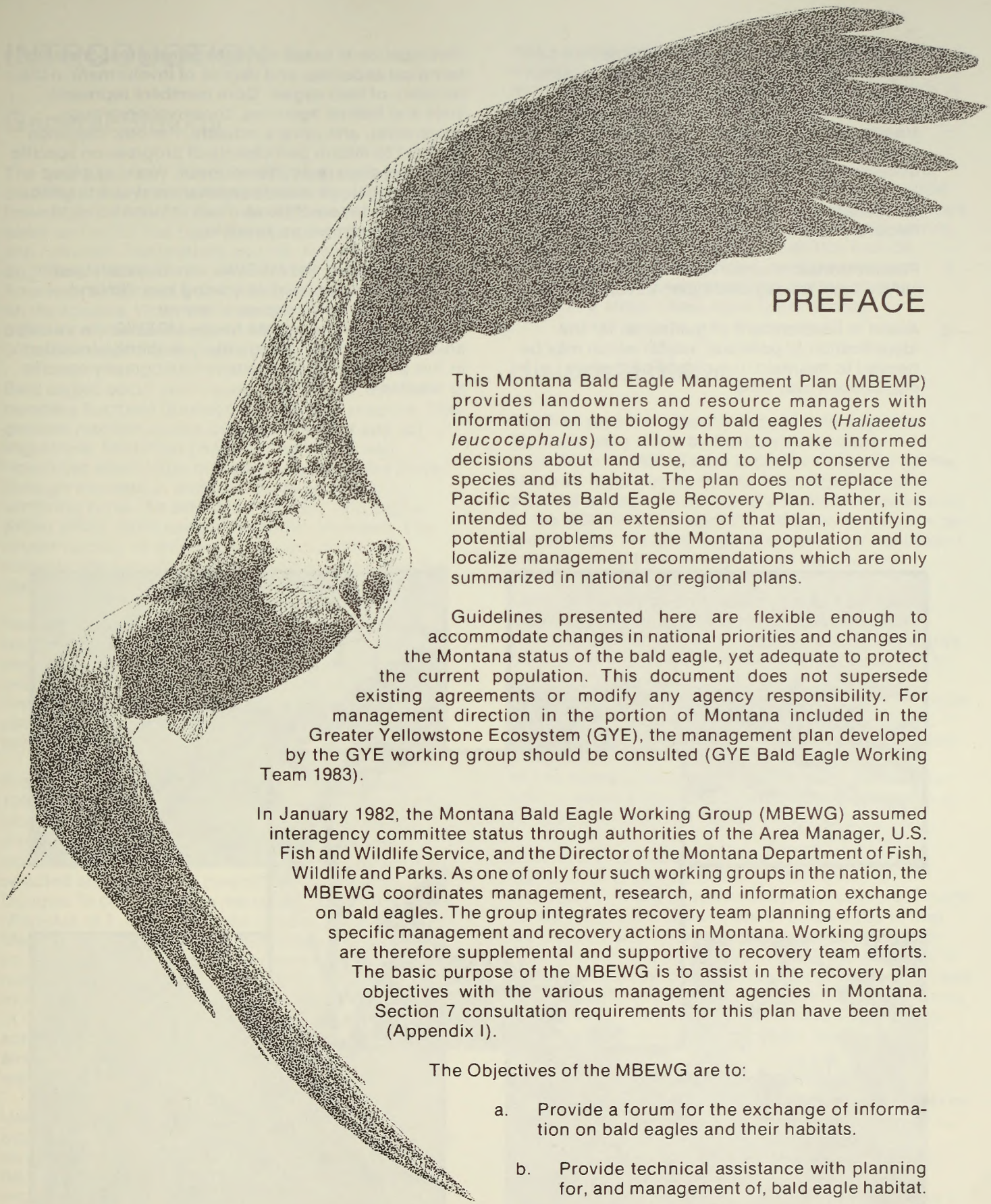
The bald eagle was classified as endangered in Montana in 1978. Montana supports both nesting and wintering populations of bald eagles in addition to large numbers of eagles which migrate through the state each spring and fall.

Intensive surveys since 1980 suggest that Montana's population of nesting bald eagles is expanding. From 1980 to 1984, known nesting territories have increased from 34 to 63 with the number of breeding pairs increasing from 25 to 51. Production of young eagles from Montana nests is among the highest recorded for any western state. The present distribution of nest sites is similar to historical trends except for the current absence of active nests in northeastern Montana.

The management goal for bald eagles in Montana is 99 breeding pairs proportionately distributed throughout the state. Habitat analysis indicates that Montana could potentially support a maximum of 140 breeding pairs.

Recommendations are offered to reduce and report eagle mortalities, develop effective public information programs, prioritize research activities and accurately monitor bald eagle movements and nesting activity.

The management plan proposes interim guidelines to analyze and coordinate land use activities in Montana bald eagle habitat. The MBEWG strongly urges the development of individual management plans which include site-specific habitat features and behavioral characteristics of resident bald eagles.



PREFACE

This Montana Bald Eagle Management Plan (MBEMP) provides landowners and resource managers with information on the biology of bald eagles (*Haliaeetus leucocephalus*) to allow them to make informed decisions about land use, and to help conserve the species and its habitat. The plan does not replace the Pacific States Bald Eagle Recovery Plan. Rather, it is intended to be an extension of that plan, identifying potential problems for the Montana population and to localize management recommendations which are only summarized in national or regional plans.

Guidelines presented here are flexible enough to accommodate changes in national priorities and changes in the Montana status of the bald eagle, yet adequate to protect the current population. This document does not supersede existing agreements or modify any agency responsibility. For management direction in the portion of Montana included in the Greater Yellowstone Ecosystem (GYE), the management plan developed by the GYE working group should be consulted (GYE Bald Eagle Working Team 1983).

In January 1982, the Montana Bald Eagle Working Group (MBEWG) assumed interagency committee status through authorities of the Area Manager, U.S. Fish and Wildlife Service, and the Director of the Montana Department of Fish, Wildlife and Parks. As one of only four such working groups in the nation, the MBEWG coordinates management, research, and information exchange on bald eagles. The group integrates recovery team planning efforts and specific management and recovery actions in Montana. Working groups are therefore supplemental and supportive to recovery team efforts. The basic purpose of the MBEWG is to assist in the recovery plan objectives with the various management agencies in Montana. Section 7 consultation requirements for this plan have been met (Appendix I).

The Objectives of the MBEWG are to:

a. Provide a forum for the exchange of information on bald eagles and their habitats.

b. Provide technical assistance with planning for, and management of, bald eagle habitat.

c. Identify and interpret bald eagle habitat requirements consistent with current research on bald eagle ecology.

d. Facilitate research on and management of bald eagles in Montana by: (1) suggesting research priorities, (2) reviewing proposals to avoid duplication of effort, (3) coordinating and standardizing procedures for wintering and nesting surveys, and (4) ensuring the availability of current bald eagle data.

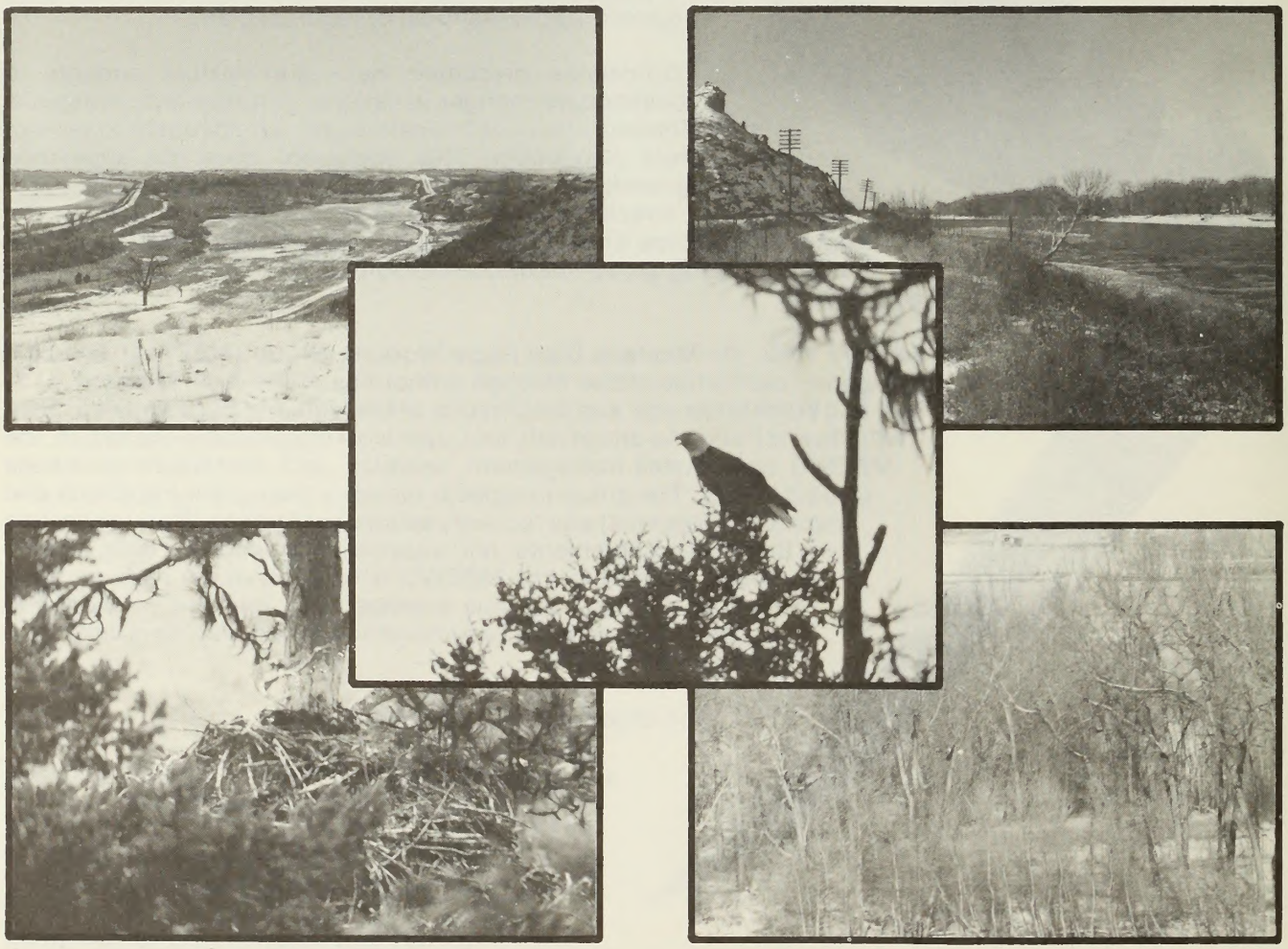
e. Cooperate with the Pacific States Bald Eagle Recovery Team.

f. Provide consistency for nesting territory and winter roost management plan development.

g. Assist in development of guidelines for the identification of potential habitat which may be needed to maintain or increase bald eagle populations over time.

Participation is based on management responsibility, technical expertise, and degree of involvement in the recovery of bald eagles. Core members represent state and federal agencies, conservation groups, universities, and private industry. Periodic meetings are held to inform participants of progress on specific tasks and acquire additional input. Working group meetings include outside speakers and open public sessions to incorporate as much information and public involvement as possible.

When requested, the MBEWG can also assist public and private landowners in solving specific land problems related to eagles. However, recommendations offered by the MBEWG are strictly advisory and carry no regulatory authority. Included in this plan is a comprehensive bibliography specific to Montana.



INTRODUCTION

General Biology

The bald eagle may live up to 45 years, achieve sexual maturity at 4-5 years, and produce 1-3 young per year. Interest in the species has been substantial in recent years and much has been learned about its biology and behavior. Publications by U.S. Army Corps of Engineers (1979), Lincer et al. (1979), Brown and Amadon (1968), and Snow (1973) provide references on the species. What is known of the biology and behavior of the bald eagle in Montana is generally consistent with the literature.

Bald eagles occur year-round in Montana, but their numbers fluctuate dramatically between seasons. The greatest number occurs during the spring and fall migrations. Migration peaks during March and November when large numbers of bald eagles move through the state to and from more southerly wintering areas. An estimated 450-500 bald eagles winter along major waterways within Montana. The lowest number of bald eagles occurs during the summer when approximately 50 pairs nest within the state.

Nesting chronology in Montana is well documented. Nest maintenance and construction occurs during winter months. Eggs are laid between late February and late April, with peak laying during early March. Fledging dates vary accordingly, with most fledging about mid-July. Little is known of post-fledging behavior in Montana.

Preliminary nest site analysis (Wright and Escano 1986) describe bald eagle nest site characteristics for Montana. Most nests are located in timber stands three acres (1.2 hectares) or larger with canopy closure of less than 80 percent. Live trees most often selected are ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*) and cottonwood (*Populus sp.*). Snags of these species are also utilized. Most nests are in mature or over-mature dominant or co-dominant trees with open crowns and sturdy horizontal limbs. Most nests are found on flat to moderately sloping terrain with northern aspects and in line of sight to a lake or reservoir greater than 80 acres (32.4 hectares) in size, or fourth order or larger stream. All nests are within one mile (1.6 km) of a water body with an adequate food supply.

Use of winter habitat is not fully understood. The occurrence of open water along major waterways with an associated food source influences winter distribution. Swenson et al. (1981) found that of bald eagles wintering in southeastern Montana, "most wintered on the major rivers, some were associated with upland/riparian wintering areas and a very few wintered strictly on upland sites." Carrion and jackrabbits (*Lepus sp.*) are used in upland habitats in portions of eastern Montana. Data on roost sites and behavior are lacking.

Most bald eagle feeding ecology in Montana is not well documented. Preliminary observations suggest that important prey are waterfowl, salmonids, suckers (*Catostomus sp.*), whitefish (*Prosopium sp.*), carrion and small mammals. Important habitats include wetlands, major water bodies, spring spawning streams, ungulate winter ranges, spring green-up areas, and areas where open water occurs.

Historical Status

The first recorded observations of bald eagles in Montana were made by the Lewis and Clark expedition in 1805. As the expedition traveled up the Missouri River during spring, bald eagles became plentiful enough to command attention. In the vicinity of the Milk River, on April 28, 1805, Lewis noted in his journal that "the Bald Eagle are more abundant than I ever observed them in any Part of the country."

Many of the birds Lewis refers to may have been migrating eagles, adults and subadults. Harmata (1984) described migration paths of adult bald eagles from wintering grounds in southcentral Colorado as passing though eastern Montana in early April. Harmata also observed that subadults are two to three weeks later in arriving on the summering grounds, suggesting their presence in eastern Montana as later in April. A minimum of eight times as many bald eagles migrate through the lower Yellowstone River area of eastern Montana as winter there (Swenson et al. 1981 and Swenson 1983).

Edward Harris (McDermott 1951) traveled up the Missouri River to Fort Union in 1848 with J. J. Audubon on a trip of scientific investigation, but made no mention of the occurrence of bald eagles in that area. Harris and Audubon did not travel to the Milk River and beyond as Lewis and Clark did. Removal of cottonwood trees to power steamboat traffic may have been a significant factor limiting bald eagle use along the Missouri River during the last century, and may have compromised preferred eagle habitat.

Some years later, Cooper (1868) made extensive notes on Montana wildlife but did not directly observe bald eagles. He stated that golden eagles (*Aquila chrysaetos*), ". . . probably find prey more easily caught on The Great Plains, and have not yet been observed west of the mountains where the White-headed Eagle is so abundant, while the latter is quite scarce on the plains, though sometimes seen."

Silloway (1901) did not report the bald eagle for Flathead Lake but did mention the species occurred near the head of Swan Lake. One adult specimen was collected at Swan Lake in the latter part of August, 1900.

E. S. Cameron (1907) spent many years studying birds throughout southeastern Montana. He reported only a single instance of bald eagles nesting in a large pine tree at the head of Horse Creek, three miles (4.8 km) west of Knowlton in 1893. Based on his interviews with early pioneers, Cameron stated that bald eagles were seen along the Powder River in the early 1880s and a pair nested in 1883 on the east side of the river 15 miles (24 km) south of Terry near Coal Creek. An adult was again seen there in 1885. He also mentions bald eagles being shot or found dead from strychnine bait put out for wolves (*Canis lupis*). Poisoning of wolves and other predators was widespread from the late 1880s until about 1940 (Flath 1975).

Saunders (1921) concluded that the bald eagle occurs in greatest numbers in ". . . the mountains of the northwest part." His summer sightings, however, suggest that bald eagles were uncommon as a breeding species early in this century. All his references describe the species as rare, though a number of specific or implied breeding records are mentioned. Skaar (1980) has summarized all of Saunders' known or suspected breeding records on a latilong basis. Specific summer records mentioned by Saunders (1921) include Bozeman, July, 1909; Belton (West Glacier), June 30, 1915; Dutton (near the Teton River), June 23, 1916; and a known nest site on the Boulder River near Big Timber (no date).

Lewis' observations suggest the species was common. However, it is unclear whether he observed nesting or migratory eagles. From the other historic accounts, it seems apparent that with the influx of the white man the bald eagle population suffered a decline. Mortality factors and habitat destruction included poisoning by wolfers, shooting by travelers, and timber removal by woodcutters (Taylor 1898).

These historic testimonies, taken as a whole, suggest that breeding bald eagles were found throughout the state with highest densities in northwestern Montana.

Poison, human disturbance, loss of nest trees, and shooting probably continued to affect bald eagles during the 20th century, and a new threat, DDT, began to appear. In the late 1960s, DDT and its metabolites were responsible for poor reproduction and a drastic decrease in eagle numbers (Sprunt et al. 1973 and Wiemeyer et al. 1972). The impact on Montana eagles is unknown, but at least seven nest sites in eastern Montana and one in western Montana were abandoned between 1953 and 1976.

Current Status

Prior to 1978, little attention was given to bald eagles on a statewide basis. The bald eagle was classified as endangered on February 14, 1978 (43 FR 6233). State and federal agencies were therefore mandated to protect and conserve the species and its habitat. In 1978 only 12 nesting territories were known in Montana. Increased survey emphasis and population increases have resulted in a much larger inventory of bald eagle nests today. Sixty-one current or historic territories were checked during 1984. Distribution was similar to historic distribution, except that no bald eagles nested in the northeastern part of the state.

Intensive bald eagle nesting surveys were initiated in 1980. The MBEWG coordinated interagency surveys in 1982. Survey data indicate an increasing nesting population (Table 1). The 5-year average of 1.28 young per occupied nest and 68 percent nest success exceeds the parameters Sprunt et al. (1973) suggested for maintenance of a stable population which varied from .8 to 1.1 young per occupied site. The Montana bald eagle nesting population is the most productive in the western United States (Table 2). Since 1978, the number of occupied territories has more than doubled. Some of the increase is

TABLE 1

NESTING PERFORMANCE OF BALD EAGLES IN MONTANA

	1980	1981	1982	1983	1984	Average
Territories known	34	37	46	55	63	
Complete survey	23	28	33	48	55	79%
Occupied	25(19)*	27(25)	38(32)	42(39)	51(44)	
Active	19(16)	23(23)	31(27)	38(37)	41(37)	
Successful	14(13)	19(19)	25(21)	28(25)	30(28)	
Young fledged	28(26)	38(38)	44(37)	59(54)	51(48)	
Occupancy rate	83%	83%	97%	81%	80%	85%
Nesting success	68%	76%	66%	64%	64%	68%
# Fledged/occupied	1.37	1.52	1.16	1.38	1.09	1.28
# Fledged/active	1.62	1.65	1.37	1.46	1.30	1.45
Brood size	2.00	2.00	1.76	2.16	1.70	1.92

* Total number known by category, and number with complete survey, by category.

due to increased survey effort and coverage. However, 13 new territories are known to have been initiated since 1980.

Abundance of bald eagles in the state in winter has only recently been assessed. National Wildlife Federation winter counts (Figure 1) show approximately 450 to 500 wintering bald eagles.

The autumn concentration of migrant eagles at McDonald Creek in Glacier National Park is unique (Table 3). As many as 600 bald eagles have been counted feeding on spawned out kokanee salmon (*Oncorhyncus nerka*). Research to determine local and long range movements of these birds and the number that remain in Montana is underway (McClelland et al. 1982). Peak counts only represent a portion of the total number of eagles which pass through the McDonald Creek area during fall migration.

Human-caused mortality of bald eagles continues to occur in Montana. Factors include shooting, accidental trapping, electrocution, collisions, and poisoning. Poisons as a source of mortality have decreased in recent decades. DDT and its metabolites have also decreased in Montana in the last 10 years. This combination of reduced mortality and increased reproductive success is probably the basis for current population growth.

Some forms of habitat alteration have increased over historic levels. This trend will undoubtedly continue, reducing the availability of suitable habitat for bald eagles in Montana. The primary sources of habitat loss or degradation are river impoundment, logging, subdivision, and human recreation. Even though the bald eagle population appears to be increasing in Montana, the long term carrying capacity may actually be decreasing. Positive steps will have to be taken to assure the security of bald eagle habitat in the future.

TABLE 2

PRODUCTIVITY OF BALD EAGLE POPULATIONS IN THE WESTERN U.S.

State	Occupancy Rate	Nesting Success	# Fledged/ Occ.	Brood Size
Montana	85%	67%	1.28	1.92
Idaho	89%	70%	1.13	1.77
Oregon	67%	63%	0.94	1.51
California	76%	60%	0.91	1.49
Wyoming	80%	56%	0.85	1.66
Washington	76%	55%	0.77	1.39

Sources: Montana, Table 1 this report, 5-year average; all other states, Draft Pacific States Bald Eagle Recovery Plan, Table 1, 5-7 year averages.

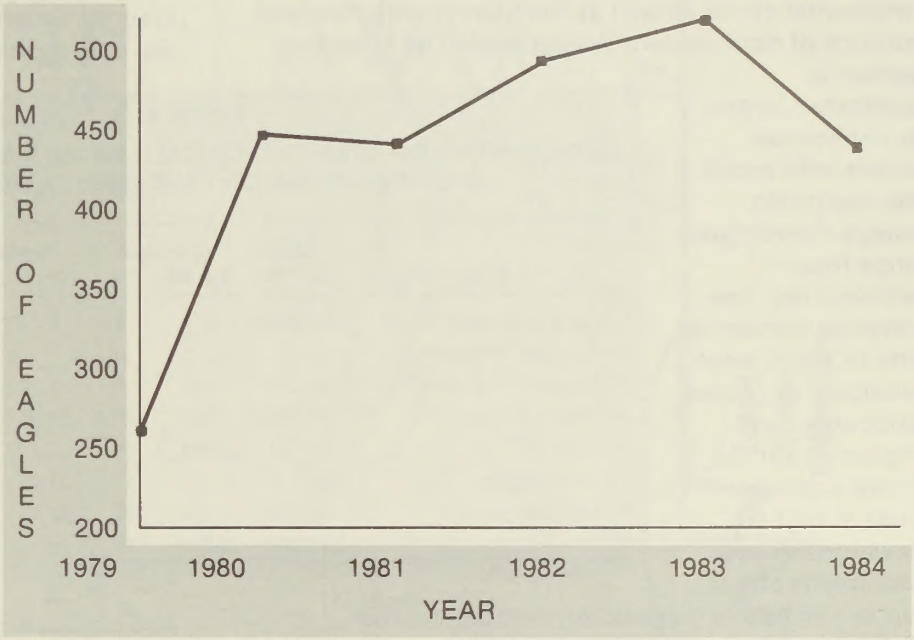


Figure 1. January counts of bald eagles in Montana
Source: National Wildlife Federation

TABLE 3

PEAK CONCENTRATION OF MIGRANT EAGLES AT MCDONALD CREEK, GLACIER NATIONAL PARK, MONTANA

Year	Date	McDonald Creek Peak Count
1978	November 29	618
1979	November 14	516
1980	November 5	377
1981	November 11	639
1982	November 3	306
1983	October 26	251
1984	November 28	571

Description of Management Zones

Seven bald eagle management zones in Montana are shown in Figure 2. Zones were established using major hydrologic boundaries, and correspond to zones identified in the Pacific States Bald Eagle Recovery Plan. Four of the seven zones extend into adjacent states. Implementation of recovery goals and actions will be applied on a zone-by-zone basis. Size and primary land use percentages of management zones are presented in Table 4.

Zone 7 Upper Columbia Basin

This zone includes all of Montana west of the continental divide as well as the Idaho panhandle and portions of northeastern Washington. The Montana portion is dominated largely by coniferous forests with broad intermountain valleys. Forest types range from relatively dry, low elevation ponderosa pine to moist, cool subalpine fir (*Abies lasiocarpa*) and Engleman spruce (*Picea englemanii*) types at higher elevations. River floodplains often support stands of black cottonwood (*Populus trichocarpa*) frequently interspersed with conifers. Physiography is generally rugged with mountain ranges drained by the Flathead, Kootenai, Bitterroot and Clark Fork River systems. Many lakes and reservoirs occur, providing an abundance of high quality riparian habitat.

TABLE 4

SQUARE MILES OF AREA IN EACH BALD EAGLE MANAGEMENT ZONE, AND AREA OF MAJOR LAND USES IN MONTANA

Zone	Area Sq. Mi.	Cropland Sq. Mi.	%	Rangeland Sq. Mi.	%	Forest Sq. Mi.	%
7-Upper Columbia Basin	24,632	973	4	3,197	13	20,051	81
18-Greater Yellowstone	2,041	0	0	509	25	1,527	75
38-Missouri Headwaters	12,021	887	7	7,288	61	3,646	30
39-Upper Missouri	21,166	5,695	27	10,524	50	4,274	20
40-Bighorn	13,577	1,888	14	8,779	65	2,612	19
41-Powder River	25,350	2,721	11	21,421	85	877	3
47-Missouri Basin	48,507	11,091	23	34,434	71	2,166	4
State	147,294	23,256	16	86,152	58	35,153	24

Zone 18 Greater Yellowstone

This zone occurs primarily in Idaho and Wyoming, and a separate management plan has been prepared for this zone (GYE Bald Eagle Working Team 1983). The Montana portion consists primarily of those lands surrounding Yellowstone National Park. The area is primarily lodgepole pine (P. contorta) and Douglas fir forest. Most bald eagle habitat lies above 6000 feet.

Zone 38 Missouri Headwaters

This zone consists of those lands which form the headwaters of the Missouri River. It is primarily mountain foothills which supports a shrub-grass community interspersed with islands and stringers of Douglas fir. Extensive cottonwood forests occur along the lower reaches of major river floodplains. The Missouri River originates at the confluence of the Gallatin, Madison, and Jefferson rivers. Other significant water bodies include Ennis Lake, and Lima, Clark Canyon, Ruby, and Willow Creek Reservoirs.

Zone 39 Upper Missouri

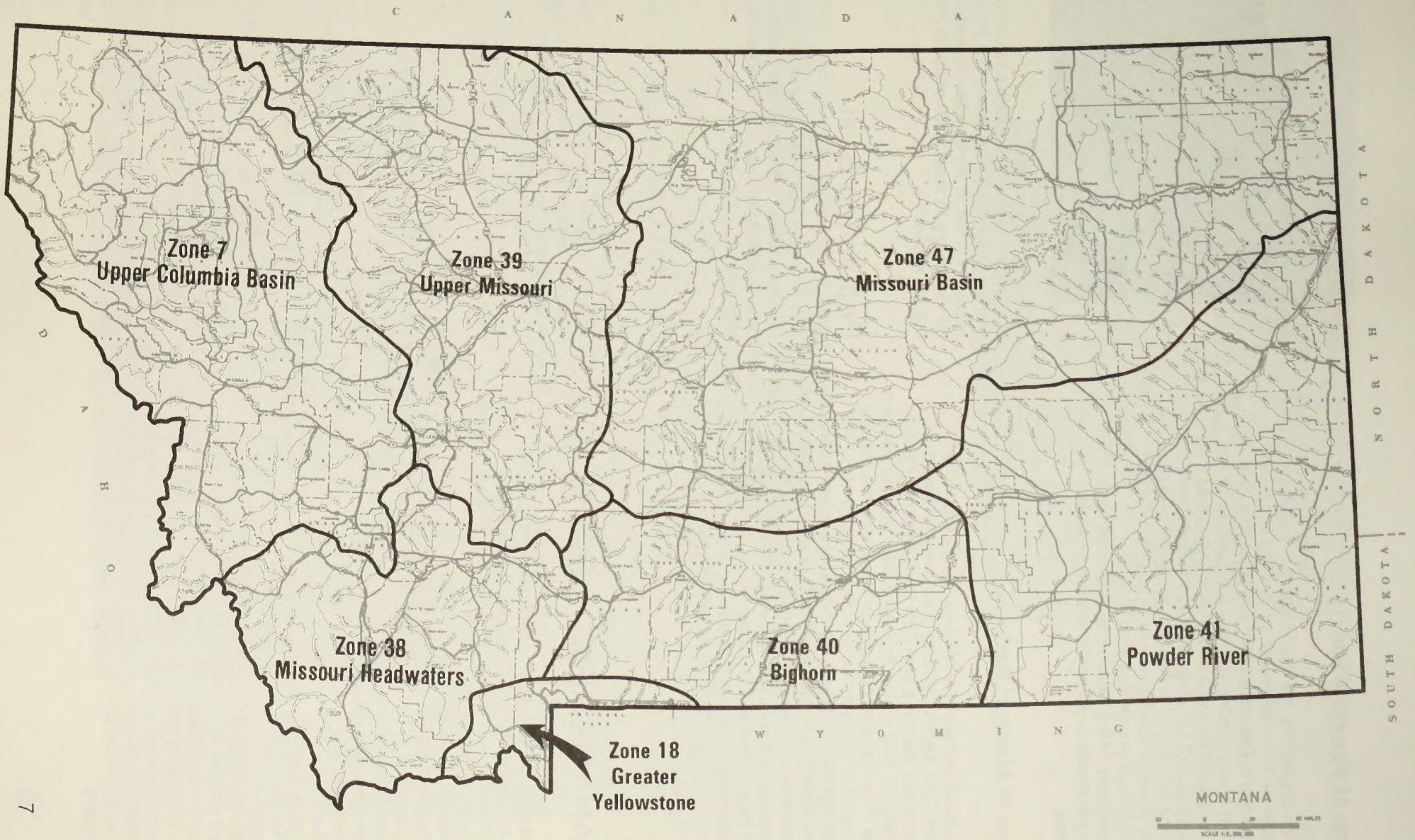
This zone is comprised of the Missouri River watershed above Coal Banks Landing in Choteau County. Extensive grass and shrub-grass steppe areas are interspersed with isolated mountain ranges, buttes, and river breaks. Northern portions of the area were heavily glaciated, and numerous potholes and alluvial benches are present. At higher elevations, the zone contains mountainous habitats. The foothill transition area, known as the Rocky Mountain Front, is important and productive wildlife habitat. Cottonwood forests are common along several major floodplains. Several major reservoirs occur in the zone.

Zone 40 Bighorn

This zone includes the Yellowstone River watershed from the town of Emigrant to the mouth of the Bighorn River. The area is characterized by a combination of high mountains, foothills, and shrub-grass steppe. River floodplains generally support mature riparian cottonwood forest, while foothill areas are dominated by juniper (*Juniperus sp.*) and pine gradually giving way to higher elevation forests of Douglas fir, Lodgepole pine, and whitebark pine (*P. albicaulis*).

Figure 2

BALD EAGLE MANAGEMENT AND RECOVERY ZONES IN MONTANA



Zone 41 Powder River

Lands drained by the Yellowstone River and its tributaries from the mouth of the Bighorn River to the North Dakota border comprise this zone. Primarily upper sonoran, this zone also extends into adjacent portions of Wyoming. Areas of grassland and shrub-grass steppe interspersed with badlands and breaks are typical of this zone. Several insular ranges of high hills occur and support ponderosa pine forests. Floodplains of the Yellowstone, Powder and Tongue Rivers support mature cottonwood forests.

Zone 47 Missouri Basin

This zone includes the Missouri River watershed below Coal Banks Landing. Many reservoirs occur throughout the zone with Fort Peck Reservoir being the largest. The area is primarily plains/upper sonoran zone. The northern portions of the area were heavily glaciated which resulted in numerous potholes. The northeast part of the area exhibits mid-grass prairie characteristics, interspersed with cropland. Heavily eroded river breaks along the Missouri and Big Dry drainages support substantial tracts of ponderosa pine forest. Pine and Douglas fir occur in several isolated mountain ranges. Mature cottonwood forests occur along the lower Missouri, Milk, and Poplar Rivers.

MANAGEMENT GOALS

The management goal for Montana is to provide secure habitat for bald eagles and to increase population levels in specific geographic areas to delist the species. The population goal is the Pacific States Bald Eagle Recovery Team's recommendation for delisting the bald eagle in Montana. The habitat goal is the number of territories needed, based on a 71 percent occupancy rate, to achieve the population goal. This occupancy rate was derived by averaging occupancy rates for a stable population (69 percent) and an expanding population (73 percent) in adjacent areas. In order to achieve the management goal, it will be necessary to meet both the population goal and habitat objective.

Population Goal

The bald eagle population goal for Montana is 99 breeding pairs. Table 5 shows the breeding population objectives for the seven zones within Montana.

Habitat Goal

It is important to recognize the need to manage habitat sufficient for a minimum of 140 nesting territories. Potential nesting territories were estimated from the existing suitable habitat within each drainage (Tables 6 and 7). Drainage-specific number of potential territories for each management zone are indicated in Table 7. Criteria considered in estimations of potential territories included subjective assessment of habitat suitability, average distance between existing nest sites, prey availability and human activities. Habitat which could be made suitable through vegetation manipulation was not considered. The status and security of each existing nesting territory will be evaluated in the

TABLE 5

EXISTING PAIRS OF BALD EAGLES IN 1984 AND POPULATION GOALS BY ZONE IN MONTANA

Zone	Breeding				
	Existing Pairs	Pair Goal	% Occ.	Avg. No. Fledged Occ. Nest	Avg. No. Young Fledged
7 Upper Columbia Basin	32	52	Completed upon approval of the Pacific States Bald Eagle Recovery Plan.		
18 Greater Yellowstone	8	6			
38 Missouri Headwaters	2	6			
39 Upper Missouri	2	10			
40 Bighorn	2	11			
41 Powder River	5	8			
47 Missouri Basin	0	6			
TOTAL	51	99			

TABLE 6

EXISTING AND POTENTIAL BALD EAGLE NESTING TERRITORIES IN MONTANA

	Zone	Existing Nesting Territories	Potential Nesting Territories
7	Upper Columbia Basin	35	73
18	Greater Yellowstone	8	9
38	Missouri Headwaters	5	8
39	Upper Missouri	3	13
40	Bighorn	4	16
41	Powder River	5	12
47	Missouri Basin	0	9
	Total	60	140

TABLE 7

CURRENT AND POTENTIAL BALD EAGLE TERRITORIES IN KEY AREAS BY MANAGEMENT ZONE IN MONTANA

Key Areas	Known Territories	Additional Territories Needed	Total Potential Territories
Zone 7 Upper Columbia Basin			
Bitterroot R.	2	4	6
Blackfoot R.	6	1	7
Clearwater/Swan R.'s	2	7	9
Clark Fork R.			
Garrison to Clinton (Including Rock Creek)	0	3	3
Kelly Jct. to Idaho	1	3	4
Flathead R.			
North Fork	3	3	6
South Fork (Hungry Horse Res.)	1	2	3
Middle Fork	0	1	1
Upper Main	3	2	5
Lower Main	1	3	4
Flathead Lake	3	1	4
Whitefish/Stillwater	4	1	5
Kalispell West	4	0	4
Fisher R.	0	3	3
Kootenai R.	2	1	3
L. Koocanusa	2	0	2
Yaak R.	0	1	1
Bull R. and Lake	1	1	2
Georgetown Lake	0	1	1
TOTAL ZONE 7	35	38	73

Table 7 (continued)

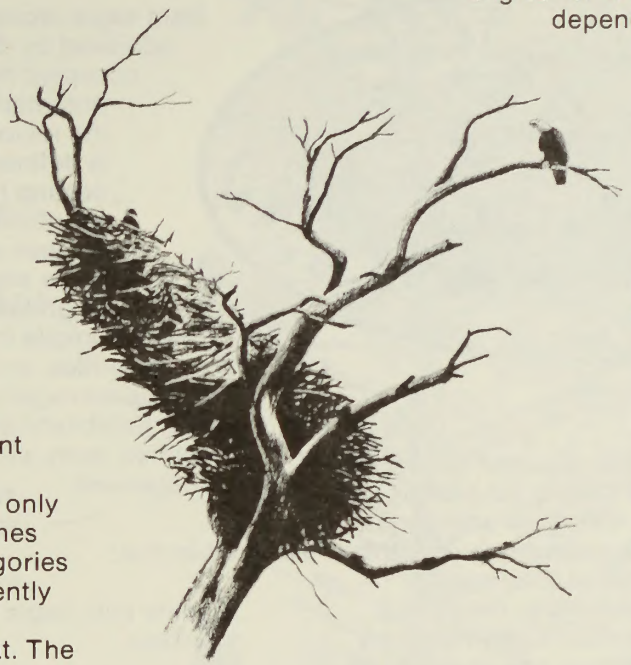
Key Areas	Known Territories	Additional Territories Needed	Total Potential Territories
Zone 18: Greater Yellowstone			
Yellowstone R.	0	1	1
Madison R.	4	0	4
Centennial North	4	0	4
TOTAL ZONE 18	8	1	9
Zone 38 Missouri Headwaters			
Jefferson R. (Including Big Hole and Beaverhead)	4	0	4
Madison R.	1	1	2
Gallatin R.	0	2	2
TOTAL ZONE 38	5	3	8
Zone 39 Upper Missouri			
Waterton Lake	1	0	1
Teton R.	0	1	1
Sun R.	0	2	2
Tiber/Marias	0	2	2
Blackfoot Reservation	0	3	3
Upper Missouri Reservoirs	2	1	3
Smith R.	0	1	1
TOTAL ZONE 39	3	10	13
Zone 40 Bighorn			
Yellowstone R.	0	8	8
Clark's Fork R.	2	0	2
Bighorn R.	2	3	5
Stillwater R.	0	1	1
TOTAL ZONE 40	4	12	16
Zone 41 Powder River			
Yellowstone R.	4	4	8
Little Missouri R.	0	1	1
Tongue R.	1	1	2
Powder R.	0	1	1
TOTAL ZONE 41	5	7	12
Zone 47 Missouri Basin			
Milk R.	0	3	3
Missouri R.	0	3	3
Poplar R.	0	1	1
Musselshell R.	0	2	2
TOTAL ZONE 47	0	9	9

future. This goal is based on the best biological information currently available. As additional data are gathered, appropriate adjustments will be made.

MANAGEMENT OBJECTIVES AND GUIDELINES

Introduction

Recommendations presented here provide an appropriate degree of protection to bald eagles and their habitats. Interim guidelines for nest sites and adjacent habitat are presented later in this document. They are intended to be used until a site-specific management plan for the nest territory is prepared and implemented. Many management actions will have a wide range of applicability, while some may relate only to specific situations. These guidelines address needs unique to three categories of essential bald eagle habitat, currently occupied nesting habitat, potential nesting habitat and wintering habitat. The guidelines apply to Montana habitats generally, but for Zone 18, Greater Yellowstone Ecosystem, reference should be made to the Bald Eagle Management Plan for the Greater Yellowstone Ecosystem (GYE Bald Eagle Working Team 1983).



Currently Occupied Nesting Habitat

Traditional use of nests is a result of a combination of factors that make a specific area best suited for successful reproduction. Management attention should be devoted to maintaining the suitability of these sites.

The following guidelines provide only general management direction for nest territories. Ultimately, site-specific management plans should be developed for each nesting territory. Such plans should result from monitoring and evaluation of each territory.

Management of nest sites and associated foraging habitat will be necessary to maintain or enhance habitat quality.

Objective:

Develop site-specific management plans.

Guideline:

Site-specific management plans are of central importance to long-term management of bald eagles in Montana and should replace dependence on interim guidelines at the earliest opportunity. Prior to development of site-specific plans, the interim guidelines should be used for nest territory management. On public lands the responsible federal land management agency should work closely with Montana Department of Fish, Wildlife, and Parks (MDFWP) to develop site-specific management plans. On state and private lands it will be the responsibility of MDFWP to contact landowners and develop the most acceptable plans. Development of site-specific plans should include input from all knowledgeable sources and affected parties. The expertise of the MBEWG is available and should be used. Appendix II provides a standard format and recommended steps for developing site-specific territory management plans. The MBEWG will review site-specific management plans for adequacy upon request.

Objective:

Maintain suitable nesting habitat in all known bald eagle territories.

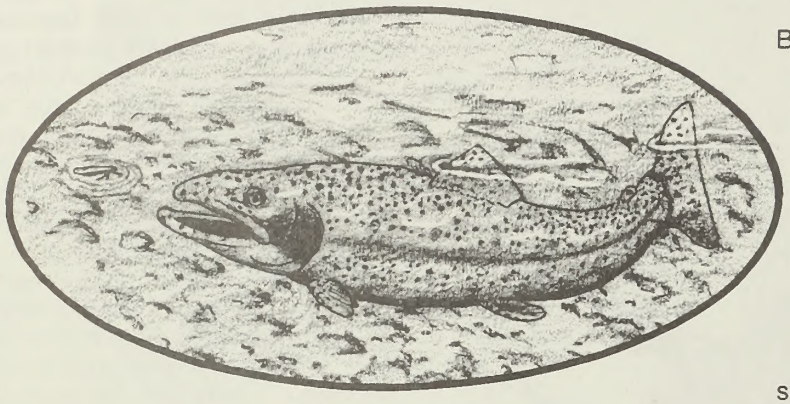
Guideline:

Nest sites should be high priority for preservation or acquisition, especially in areas planned for development. If management philosophies for adjacent private land are not consistent with bald eagle conservation means to secure the habitat should be pursued. This could be through lease, purchase, easement, exchange, cooperative agreement, reserves, or special management areas. Agencies should incorporate nest territory guidelines in land use plans, such as resource management

plans, forest management plans, and timber and range management plans. Also, where appropriate, territory guidelines should be incorporated in the development of covenants and regional and county land-use zoning policies.

Objective:

Maintain and enhance adequate habitat for prey species within existing bald eagle nesting habitat.



Guideline:

In Montana, fish, waterfowl and ungulate carrion constitute the bulk of the diet during the nesting season. Management of fish, waterfowl and ungulate populations and their habitats adjacent to or within bald eagle home ranges is critical. Examples of management options are presented in the habitat narrative of the Pacific States Bald Eagle Recovery Plan. Review of projects to control non-sport fishes, chemical control of aquatic insects, and stream channelization with appropriate recommendations is essential to preserving bald eagle habitat.

Objective:

Eliminate disturbances during the nesting period.

Guideline:

Human activity can cause reproductive failure. Site specific management plans should be designed to protect the nesting pair from disruptive activities during the nesting season based on individual pair tolerances.

Objective:

Reduce bald eagle mortality.

Guideline:

The most important step in reducing human caused bald eagle mortality is an effective educational program coupled with law enforcement. Every effort should be made to eliminate pesticides, especially organochlorides, that can contaminate the food chain. Road closures near eagle nests and/or nest wardens may be necessary where shooting and human activity is a problem. Powerlines in home ranges should be planned to avoid eagle flight paths. All powerlines should be examined and modified if necessary to minimize electrocution or collision potential.

Potential Nesting Habitat

Bald eagle recovery in Montana cannot be achieved by managing only currently occupied nesting habitat. Management of potential nesting must be an integral part of the recovery effort. Potential nesting habitat is defined as suitable but unoccupied nesting habitat. In those areas where insufficient suitable nesting habitat exists to achieve recovery, this definition includes those sites which can be made suitable through habitat enhancement. The MBEWG will compile information on potential sites, set priorities, and provide justification for intensive management to support 140 nesting territories. Establishment of breeding pairs on suitable identified lands will be encouraged by direct management.

Objective:

Identify bald eagle potential nesting habitat in Montana.

Guideline:

Wright and Escano (1986) have prepared a preliminary nest site analysis for Montana. It contains a detailed users guide for mapping potential nesting habitat. A summary of that work is contained in Appendix VIII. Federal land management agencies will be responsible for mapping potential habitat on their respective lands. MDFWP will be responsible for mapping potential nesting habitat on a management unit basis, and will assist the responsible agency or landowner in selecting specific areas needed to meet management unit habitat objectives.

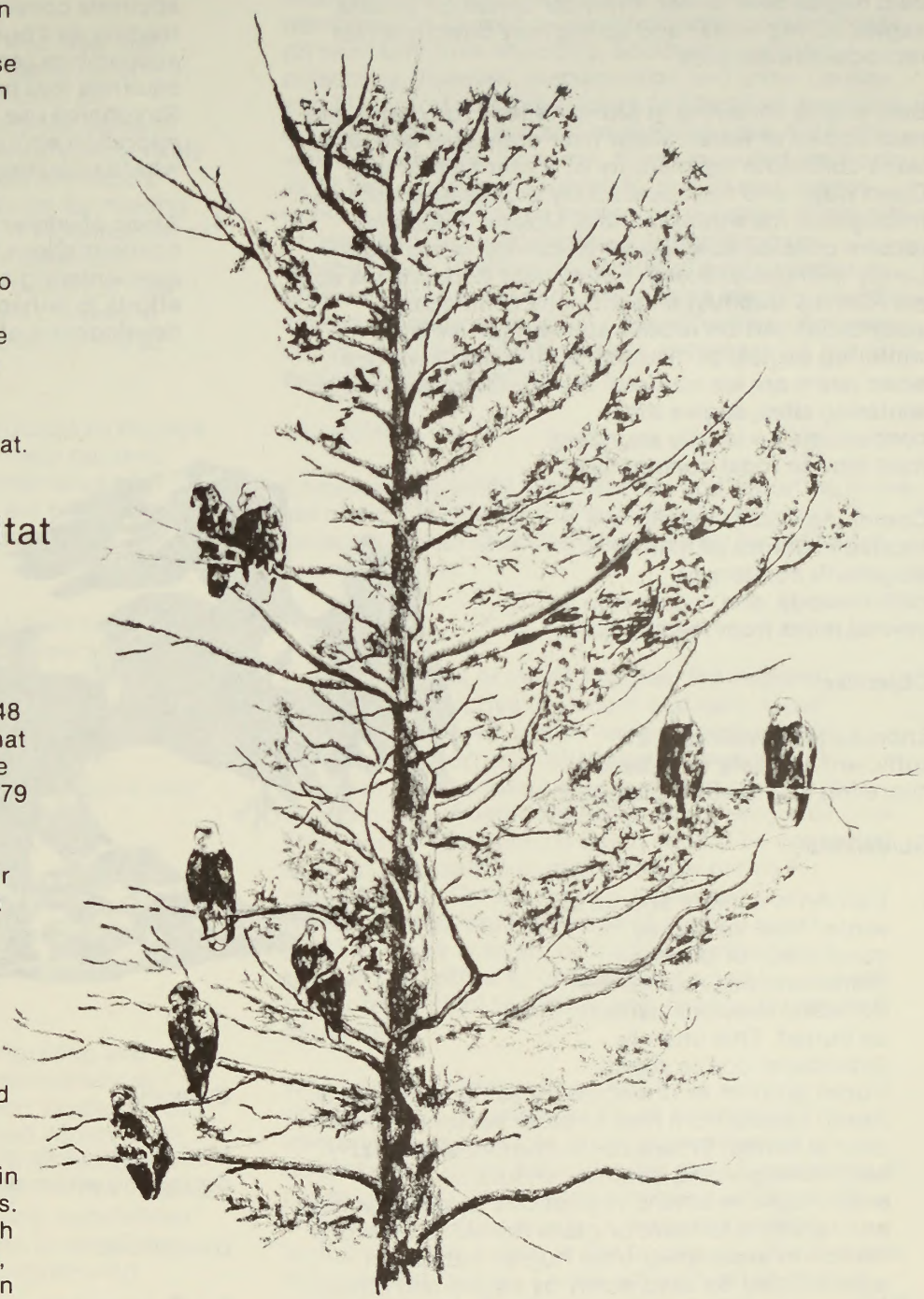
Objective:

Maintain or enhance the suitability of delineated potential nesting habitat.

Guideline:

Special management attention will be required to maintain sufficient potential nesting habitat consistent with recovery objectives for the long term.

Management to maintain potential nesting habitat is the same as for currently occupied habitat, except for the element of short-term disturbance. Non-permanent human activities are not as critical in unoccupied habitat. The primary use and home range areas in the interim guidelines should be implemented around all delineated potential nesting habitat. Implementation of these guidelines should secure this habitat for the currently expanding population. Site specific analysis should be completed at each area to evaluate the need for enhancement measures to: (1) increase the future occupancy potential, (2) assure the long term maintenance of habitat suitability, and (3) manage for long-term integrity of riparian habitat.



Winter/Migration Habitat

In 1979, the National Wildlife Federation initiated a nationwide, mid-winter bald eagle survey in an effort to determine bald eagle wintering populations in the lower 48 states. Montana's participation in that survey resulted in the first statewide winter survey on record. Prior to 1979 very little quantitative information was available on numbers of bald eagles wintering in Montana or their statewide distribution. Since 1979 a new awareness of wintering and migrating bald eagles has evolved. The mid-winter survey has become an annual event with a five year average of 47 participants representing state and federal agencies, private organizations, and individuals.

Montana ranks in the top 15 states in the total number of wintering eagles. Over 1,000 bald eagles pass through Glacier National Park each autumn, stopping to feed on kokanee salmon before moving southward through western Montana. Peak counts may be as high as 600 birds in a single day (see Table 3). Many birds also migrate through the eastern portion of the state. Eastern and western Montana are important migration routes for both fall and spring migrants.

Seasonal habitat for bald eagles is an important element in the maintenance and recovery of the species. The objective of managing these habitats is to provide optimal conditions to maintain numbers of bald eagles over winter. Physical condition of bald eagles during winter and spring may directly affect reproductive success.

Bald eagles wintering in Montana tend to congregate near bodies of water. Major river drainages and large lakes constitute the majority of winter habitat use. Open water and food availability dictate areas of use throughout the winter months. Upland areas may receive considerable use when carrion is available. Lands with cattle, sheep, horse, deer (Odocoileus sp.), elk (Cervus elaphus) and antelope (Antilocarpa americana) carrion receive substantial use by wintering eagles, particularly during harsh winters when rivers are ice covered. During migration and at wintering sites, eagles that concentrate on locally abundant food tend to roost communally.

Communal roosts usually are located in stands of mature or oldgrowth conifers or cottonwoods, and roosts may be several miles from feeding sites.

Objective:

Encourage provision of a sufficient and safe food base for migrating and wintering eagles.

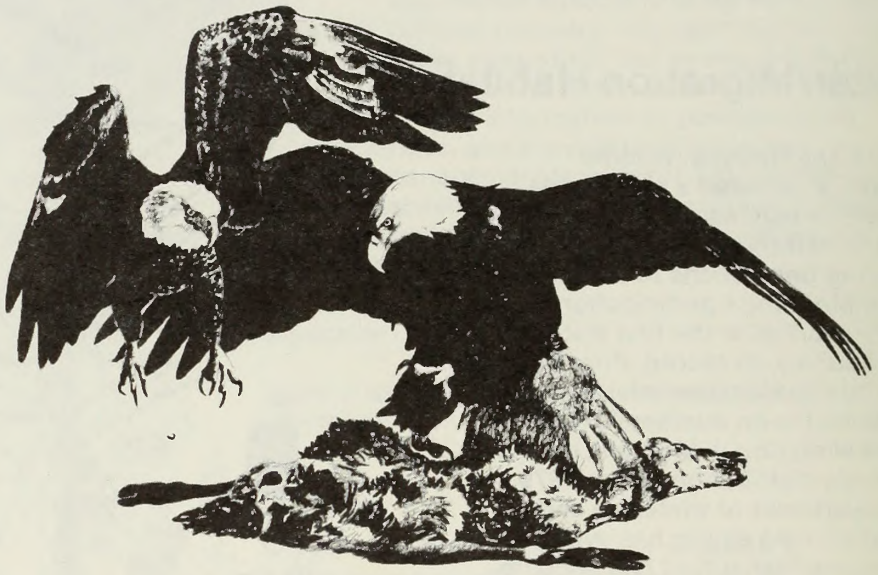
Guidelines:

1. Carrion is a major source of winter food for eagles in some areas of Montana. Some counties require that domestic livestock carrion be buried. This often is impractical due to solidly frozen ground, or unnecessary as there is no real health hazard from flies or other vectors and no odor in winter. Where not in conflict with grizzly bear management, counties should be encouraged to amend regulations to allow farmers and ranchers to leave or place domestic livestock carrion in areas away from human habitation where it may be used safely by eagles and other scavengers. Most carcasses are consumed after only a few days.

2. Spawning runs of kokanee salmon, whitefish, suckers, and other species provide an important food source for migrating eagles. Harvesting and other impacts on these populations should be regulated with the welfare of eagles given due consideration.

3. During spring migration bald eagles prey on ground squirrels (Spermophilus sp.) that have recently emerged from hibernation. On many ranch and farm lands, strychnine is used to poison squirrels considered undesirable because of their feeding and burrowing habits. Eagles may succumb to secondary poisoning by feeding on squirrels that have ingested the poison. Strychnine use should be avoided until after migration approximately April 20, in those areas where migrating eagles feed.

4. Areas of winter and early spring waterfowl concentrations are important for some overwintering and migrating eagles. In general, efforts to enhance existing wetlands and development of new ones should be supported.



Objective:

Minimize the risk of bald eagle injury and mortality during the winter and migration periods.

Guidelines:

1. Responsible personnel should remove road-killed animals from road and railway edges. Eagles are attracted to carrion along roadsides during winter months. In leaving roadside carrion when a vehicle approaches, eagles often cross the road and are vulnerable to oncoming high speed traffic. Carrion should be removed to areas away from public vehicle travel where eagles may feed undisturbed and in safety.

2. Identify electric line poles which pose an electrocution or collision threat to eagles. A threat exists where lead and/or ground lines are placed so that eagles may touch both simultaneously.

   The greatest threat is from lines with less than 69,000 watts. Such poles can be easily modified. Responsible power companies should be contacted and requested to modify the poles in question. Poles near feeding areas are most likely to be used as perch sites and need immediate evaluation. Two main considerations for making powerlines safe for eagles are: (1) modification of existing lines which pose electrocution and collision hazards, and (2) proper design of new facilities. These considerations are covered in Raptor Research Report No. 4 (Olendorff et al. 1981).

3. Encourage all hunter safety instructors to include a section on raptor protection in their courses. Educating young hunters about the value of raptors and the fact that they all are protected by federal and state law may help reduce the incidence of eagle shooting.

4. Support efforts to eliminate placement of leg-hold traps near sight baits. Eagles are vulnerable to such trap sets, intended for predators and furbearers. Encourage the Montana Trapper's Association to educate their members about the need to eliminate this practice. Support a regulation requiring that traps not be placed near (not less than 20 feet from) sight baits.

Objective:

Identify and provide protection for communal roosts.

Guidelines:

1. In areas of concentrated food, migrating and wintering eagles tend to roost communally at night. Few winter roosts have been located in the state although many are suspected. Most roosts probably possess microclimates that reduce an eagle's energy loss during the night. If not located, roosts may be destroyed by logging, subdivision or other activities. Once a location is identified, steps should be taken to provide continuing protection of the habitat.

2. Eagles are under stress during migration and at wintering sites, especially when food is scarce and temperatures are low. Disturbance that causes eagles to fly from communal roosts, feeding sites or perches causes additional energy drain from the birds. Therefore, trail or cross-country routes should be designated to avoid roosts.

Mortality

On a national level, the problems identified as having reduced bald eagle populations are: (1) reduced reproduction caused by environmental contaminants, (2) mortality from shooting, accidental trapping, poisoning, diseases, electrocution and other causes and (3) loss of suitable habitat. In Montana, specifics on bald eagle injuries and mortalities have not been well documented. However, those recorded implicate all of these problems. Recently, public and agency interest has resulted in increasing numbers of reports of dead and disabled eagles. Information from rehabilitation facilities and study of eagle carcasses provide valuable baseline data which identify specific causes of injury or mortality. Identification of causes and rectifying the problems are necessary for the total recovery of the species.

Objective:

Ensure consistency, cooperation, and reporting in the aid of sick, injured or orphaned specimens and salvage of dead specimens which may be useful for scientific study.

Guideline:

In handling sick or injured eagles, the primary objective is effective treatment and care. Upon locating an injured or sick eagle, biologists with a FWS special purpose rehabilitation permit and experience in handling eagles should retrieve the eagle and administer the necessary emergency care. The nearest FWS special agent should be contacted as soon as possible to make arrangements for rehabilitation. Others finding an injured or sick bird should contact the nearest FWS special agent, MDFWP game warden, or the FWS endangered species field office to get the location of the nearest raptor rehabilitation facility and arrange for retrieval of the bird.

When encountering a dead eagle the primary objectives are to gather as much site specific information as possible. Biological materials should be preserved in the best possible state for analysis of cause of death. Only those persons authorized by MDFWP and FWS permits or state and federal biologists when acting in the course of official duties, may possess eagles. Those not authorized should contact the nearest special agent, game warden, FWS or MDFWP personnel. Suggested procedures are presented in Appendix VI.

Objective:

Ensure proper handling of young eagles following nest destruction.

Guideline:

Immediately contact MDFWP in Bozeman and the FWS in Helena, Montana.

Objective:

Emphasize law enforcement of the following acts to ensure increased survival of the bald eagle.

- The Lacey Act of 1900 (16 U.S.C. 3371) prohibits transportation of wildlife or their parts or products taken or possessed illegally, across state or foreign boundaries and indian reservation boundaries where codified regulations exist.

- The Migratory Bird Treaty Act of 1918 (16 U.S. C. 703-711 40 Stat. 755) as amended, provides for regulations to control taking, selling, transporting, and importing international migratory birds, their nests, eggs, parts, or products when such items are included in terms of conventions between the USA, Canada, Mexico, and Japan.

- The Bald Eagle Act of 1940 (16 U.S.C. 668-688d; 54 State 250) as amended, provides for the protection of bald eagles by prohibiting the taking, possession, and commerce of these birds, except under certain specific conditions.

- The Endangered Species Act of 1973 (16 U.S. C. 1531-1543; 87 Stat 884) P.L. 93-205 as amended, provides for the conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging the establishment of state programs. It prohibits the unauthorized taking, possession, sale, transport, import, export, delivery, or receiving of any endangered species.

Guidelines:

1. Develop and conduct public education programs designed to reduce illegal shooting of bald eagles.

2. Report information or violations of any of the above mentioned acts to the nearest FWS special agent or MDFWP game warden as listed below.

FWS special agents in Montana:

Joel B. Scrafford
Senior Resident Agent
Rm. 3035, Federal Building
316 N. 26th Street
Billings MT 59101
406-657-6340
FTS: 585-6340

Rodney C. Hanlon
Special Agent
600 Central Plaza, Rm. 429
Great Falls, MT 59401
406-453-4761
FTS: 585-1363

Richard Branzell
Special Agent
P.0. Box 7488
Missoula, MT 59807
406-329-3913
FTS: 585-3913

Regional warden captains for MDFWP:

Region 1
Louis M. Kis
P.0. Box 67
Kalispell, MT 59901
406-755-5505

Region 2
Earle D. Davis
3309 Brooks
Missoula, MT 59801
406-721-808

Region 3
George E. Hubbard
8695 Huffine Lane
Bozeman, MT 59715
406-994-3540

Region 4
Robert R. Chesterfield
Rural Route 4041
Great Falls, MT 59405
406-454-3441

Region 5
Dennis Hagenston
1125 Lake Elmo Road
Billings, MT 59101
406-252-4654

Region 6
Ed Kelly
Rural Route 1-210
Glasgow, MT 59230
406-228-9347

Region 7
Vacant
P.0. Box 430
Miles City, MT 59301
406-232-4365

FWS endangered species office in Montana:

Wayne Brewster
U.S. Fish and Wildlife Service
Federal Building, U.S. Courthouse
301 S. Park
P.0. Box 10023
Helena, MT 59626
406-449-5225
FTS: 585-5225

Public Information Strategy

This strategy is a guide to increase public awareness and appreciation of bald eagles and their habitats. Successful recovery of the bald eagle includes public awareness of problems confronting the species and a commitment to solve those problems. Interesting and highly visible information should help foster this awareness and commitment. Informing people about the importance of bald eagles in Montana and providing an understanding of eagle habitat should encourage public participation in recovery efforts. The overall strategy must remain flexible enough to incorporate changes that may result from public response.

Objectives:

1. Educate state and federal personnel about this plan and bald eagles, enlist their support and coordinate communication strategies with them.

2. Educate and motivate the public and build support for this plan by increasing public awareness and by developing public appreciation of bald eagles in Montana.

3. Develop an extensive contact list of volunteers and conservation education people to help with the implementation of this plan.

Guidelines:

Develop awareness of newsworthiness of eagles, specifically, and wildlife in general, along with the economics of all wildlife as a resource, using the various communication outlets.

Newspaper

A press release explaining the recovery plan and the MBEMP plan should occur as well as a series of seasonal releases about Montana bald eagles. Information efforts should encourage the use of bald eagles for articles in special sections of state newspapers.

Radio and Television

Public service announcements would inform the public about the MBEMP and bald eagles in Montana. Subject matter should vary with seasonal needs. News briefs on specific activities should supplement the announcements. Efforts should be made to place involved personnel on local programs to explain this plan and discuss bald eagles in Montana.

Magazines

At least one feature article should be published in Montana Outdoors. Seasonal follow-up features should appear quarterly. Short notes about bald eagles for "Hotline" or white page sections are often effective. Articles should be encouraged in other magazines or newsletters.

Speaking Engagements

A 15-minute slide-tape program has been developed for speaking engagements with regional slides and examples of local projects. Copies have been distributed to state and federal agencies in Montana. Loan of the slide-tape program to interested organizations should be encouraged. An interesting and informative pamphlet (fact sheet of slide presentation) should be designed for distribution.

Efforts to inform conservation agency personnel and the general public are recommended. Communication with agency employees is important. Interagency communication is important for a broad base of support. MBEWG participants should indicate a willingness to present a brief program at agency meetings. A list of volunteers who are trained and knowledgeable and can present the MBEMP summary along with information about bald eagles in Montana, in an interesting and effective manner should be developed.

Associations and Groups

Present program on bald eagles using slide shows, handouts, raptor identification brochures, and posters to school and environmental groups, sportsmen clubs, guides and outfitters, local government officials and landowners. Promote eagle identification and information to hunter education classes and instructors. Design of a color poster for extensive distribution should be prepared.

Land Owners

Discuss habitat requirements provided by private land. Present suggested guidelines for management of habitat. Present "Appreciation" awards for land owners who maintain or enhance habitat, e.g. bald eagle print and plaque of recognition. Encourage coverage of the event by the media.

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Monitoring

One of the primary responsibilities of the MBEWG is coordinating data collection required to monitor the health, status and management needs of the Montana bald eagle population. The MBEWG has developed a series of standard forms and survey methodologies which have increased the efficiency, coverage and accuracy of bald eagle surveys in the state. Through interagency cooperation, knowledge about bald eagles in Montana has increased. The MBEWG coordinates the annual nesting and wintering surveys, maintains nest territory records, coordinates a bald eagle observation recording system and is conducting a nesting territory habitat analysis. The following are monitoring and survey objectives and guidelines set by the MBEWG.

Objective:

Maintain current nest record information on all bald eagle nests.

Guideline:

The nest record form establishes a permanent record of each nest location in the state. The form is simple to use and is limited to general descriptive information about the nest site. A map of the nest location and instructions on how to find the nest should be included whenever a new nest is found. It is the responsibility of the respective land management agency or MDFWP if private land is involved, to complete the nest record and send it to the MBEWG. A copy of this form and its instructions are included in Appendix III.

Objective:

Survey in a standard manner all territories known to be active since 1970 to determine status and annual productivity.

Guideline:

A form has been developed to standardize data collection during nesting surveys (Appendix IV). The MBEWG will coordinate all nesting surveys and individuals or agencies assigned specific nest survey responsibilities will receive survey forms prior to each year's survey effort. The objective is to complete occupancy, activity and fledging survey checks on each territory. Specific times of survey should be based on local nesting chronology, but occupancy surveys can occur as early as mid-February and usually no later than late March. Activity surveys will generally occur in April, and fledging surveys usually in late June or July. These surveys should be planned for the least disturbance possible. The MBEWG will compile the annual nest survey data and complete a report for distribution.

Objective:

At least once every five years, survey historic nesting territories that have not been active since 1970 to determine current status.

Guideline:

These surveys should follow the guidelines identified for nesting surveys and the form in Appendix IV should be used. The MBEWG coordinates these surveys to assure coverage. Historic territories no longer considered suitable can be dropped from the survey list.

Objective:

Survey potential nesting habitat to determine status.

Guideline:

The MBEWG coordinates these surveys to assure adequate coverage and identify priorities. Land management agencies should survey potential habitat on their lands, and the MDFWP will coordinate surveys involving private and state lands. Suspected nesting areas will have survey priority and should be checked at the earliest opportunity after reports of a nest or summer birds are received. Nest record, Appendix III, and nest survey forms Appendix IV, should to be used to record survey data. Potential nesting habitat should be surveyed on an alternate year basis until populations in Montana show signs of stabilizing.

Objective:

Complete macrohabitat descriptions of all nesting territories.

Guideline:

Macrohabitat analysis will be based on information from aerial photographs, topographic maps, and other sources to describe general nest site characteristics. A specific data entry form has been developed for bald eagle nest site descriptions. Resulting information will be used by the MBEWG to develop the potential nesting habitat model. A copy of the form and instructions are included in Appendix V.

Objective:

Complete microhabitat descriptions of all nesting territories.

Guideline:

Microhabitat analysis will be based on field survey plot data to describe nest stand vegetative characteristics. Microhabitat information will help refine the bald eagle potential habitat model, and will be the basis for development of silvicultural nesting habitat enhancement techniques. A project to complete this analysis began in 1985 and is scheduled for completion in 1986.

Objective:

Conduct seasonal surveys to identify the status of migratory and wintering populations and identify key habitats.

Guideline:

The MBEWG will coordinate the mid-winter bald eagle surveys sponsored by the National Wildlife Federation. However, additional surveys are needed to identify key non-nesting habitats in the state. The MBEWG may coordinate additional interagency surveys for fall, winter, and spring use periods. Fish concentration and spawning areas within the state will be included in the survey. Emphasis will be placed on identifying communal roost sites and staging areas.

Objective:

Complete descriptions of migration and winter habitats.

Guideline:

The MBEWG will coordinate macro and microhabitat description efforts for key seasonal habitats. This type of information will be useful in developing management techniques and/or predictive models. Methods will be consistent with nesting habitat descriptions.

Research Needs and Priorities

Research needs and priorities can be categorized into three components: (1) basic research, (2) monitoring, and (3) applied/investigative research. The strategy employed should be based on information requirements applicable to the problem at hand. Steps in determining needs and priorities should not be considered sequential and static but rather dynamic and interactive, and determined initially from perceived problems and threats to the bald eagle population. Results of basic research and monitoring will dictate specific pathways that investigative research should follow. Once out of the reactive made, management-oriented research should be implemented. A conceptual flow chart illustrating the interactive mode of research strategies and prioritization is illustrated in Figure 3.

Basic Research Needs

Survey data indicate the Montana bald eagle population is growing. A portion of that growth is a result of increased inventory effort, but biological increases are also evident. Inventory and census efforts should be maintained or increased. These should include systematic transect flights for statistically valid estimates and comparisons of population size (e.g. Wrakestraw 1973) during all seasons. Montana has responsibility for the welfare of several hundred wintering bald eagles and several thousand migrants (McClelland et al. 1982) in addition to the nesting population. Annual and seasonal surveys will help monitor productivity and identify threats to local populations before irreversible damage occurs. Surveys should be conducted concurrently by zone. Results should be compared with other zones, states, and regions in order to avoid erroneous conclusions based on declines or increases resultant from prey, weather, or non-evident shifts of local populations. Censuses along migration routes in the autumn and spring in such areas as Glacier National Park (McClelland et al. 1982) and the Yellowstone River between Miles City and the Big Horn confluence (Swenson et al. in prep, Harmata 1984) should be conducted to assess the status of Montana populations on a regional perspective.

Once the demographics of bald eagles within Montana are documented, monitoring efforts as discussed previously should be implemented. Should the need for management be determined, data needs for effective manipulation of habitats or eagles would be satisfied by investigational research projects.

Monitoring

One of the primary responsibilities of the MBEWG is coordinating data collection required to monitor the health, status and management needs of the Montana bald eagle population. The MBEWG has developed a series of standard forms and survey methodologies which have increased the efficiency, coverage and accuracy of bald eagle surveys in the state. Through interagency cooperation, knowledge about bald eagles in Montana has increased. The MBEWG coordinates the annual nesting and wintering surveys, maintains nest territory records, coordinates a bald eagle observation recording system and is conducting a nesting territory habitat analysis. The following are monitoring and survey objectives and guidelines set by the MBEWG.

Objective:

Maintain current nest record information on all bald eagle nests.

Guideline:

The nest record form establishes a permanent record of each nest location in the state. The form is simple to use and is limited to general descriptive information about the nest site. A map of the nest location and instructions on how to find the nest should be included whenever a new nest is found. It is the responsibility of the respective land management agency or MDFWP if private land is involved, to complete the nest record and send it to the MBEWG. A copy of this form and its instructions are included in Appendix III.

Objective:

Survey in a standard manner all territories known to be active since 1970 to determine status and annual productivity.

Guideline:

A form has been developed to standardize data collection during nesting surveys (Appendix IV). The MBEWG will coordinate all nesting surveys and individuals or agencies assigned specific nest survey responsibilities will receive survey forms prior to each year's survey effort. The objective is to complete occupancy, activity and fledging survey checks on each territory. Specific times of survey should be based on local nesting chronology, but occupancy surveys can occur as early as mid-February and usually no later than late March. Activity surveys will generally occur in April, and fledging surveys usually in late June or July. These surveys should be planned for the least disturbance possible. The MBEWG will compile the annual nest survey data and complete a report for distribution.

Objective:

At least once every five years, survey historic nesting territories that have not been active since 1970 to determine current status.

Guideline:

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Objective:

Survey potential nesting habitat to determine status.

Guideline:

The MBEWG coordinates these surveys to assure adequate coverage and identify priorities. Land management agencies should survey potential habitat on their lands, and the MDFWP will coordinate surveys involving private and state lands. Suspected nesting areas will have survey priority and should be checked at the earliest opportunity after reports of a nest or summer birds are received. Nest record, Appendix III, and nest survey forms Appendix IV, should to be used to record survey data. Potential nesting habitat should be surveyed on an alternate year basis until populations in Montana show signs of stabilizing.

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Research needs and priorities can be categorized into three components: (1) basic research, (2) monitoring, and (3) applied/investigative research. The strategy employed should be based on information requirements applicable to the problem at hand. Steps in determining needs and priorities should not be considered sequential and static but rather dynamic and interactive, and determined initially from perceived problems and threats to the bald eagle population. Results of basic research and monitoring will dictate specific pathways that investigative research should follow. Once out of the reactive made, management-oriented research should be implemented. A conceptual flow chart illustrating the interactive mode of research strategies and prioritization is illustrated in Figure 3.

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Once the demographics of bald eagles within Montana are documented, monitoring efforts as discussed previously should be implemented. Should the need for management be determined, data needs for effective manipulation of habitats or eagles would be satisfied by investigational research projects.

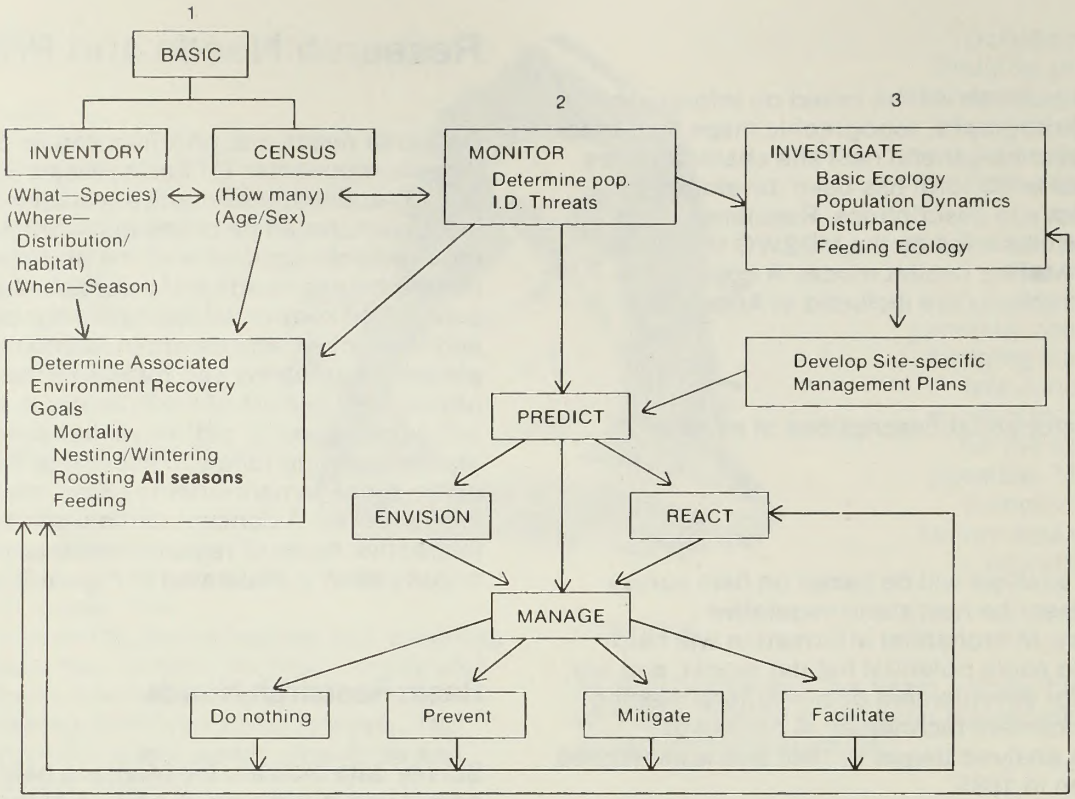

Figure 3. Interactive mode for research needs and priorities in Montana.

Applied and Investigative Research Needs

Specific aspects of bald eagle ecology in Montana are not completely understood. Based on data requirements for effective management of bald eagles, applied and investigative research needs are prioritized in Table 8. Methods and justifications are presented in Table 9.

INTERIM GUIDELINES FOR BALD EAGLE HABITAT MANAGEMENT

These guidelines should be applied to all bald eagle nesting territories and immediate habitat until a site specific management plan is prepared and implemented. Steps for preparing site specific plans are contained in Appendix II.

In conjunction with nest site management, it will be necessary to protect available habitat for future use by bald eagles. This will include coordination with private landowners and public land managers to provide the highest level of protection for eagle habitat. If necessary, more permanent protective measures including cooperative agreements, conservation easements, land donations, exchanges, purchases, and protective covenants should be considered. It will also be helpful to work with county zoning commissions, and to explore all levels of funding and incentives for private landowners. Coordination with existing groups having similar objectives is necessary for success.

Identification and resolution of conflicts will require that all proposed and existing resource uses and activities on public land will be evaluated by responsible agencies and modified to avoid adverse effects on bald eagles. Agencies should solicit input from the MBEWG on conflicts that are difficult to resolve. Examples are:

— Timber management, road management, leasing. seismic exploration, energy development, developed and dispersed recreation, grazing and other special uses.

— Floodplain and wetland management, dams, inundations, levee construction, and recreational use of reservoirs.

— Projects subject to section 10 and 404 permitting.

TABLE 8

RESEARCH NEEDS AND PRIORITIES FOR BALD EAGLES IN MONTANA (METHODS AND JUSTIFICATIONS ARE LISTED IN TABLE 9)

Priority	Category	Specific Study	Methods	Justification
1.	BASIC ECOLOGY	a) Breeding adult home range	5a,1,2	1
		b) Movements of juveniles & subadults	5a,5b,6a,6b,6c, 6d,1	2,1,7
		c) Habitat selection and use	5a,2,3,1	3,1,2,4,13
		d) Roost site description, suitability preference and use	5a,3,4,1	3,1,2,4,13
		e) Nest site characteristics	4,7	1,13,4
2.	POPULATION DYNAMICS	a) Circumstances of pioneering pairs and taxonomic relation ships; age, origin, and genetic link to other populations	6a,8,9	1,5,6,9
		b) Turnover of adult breeders; pair bond duration	6a,6c,8	7,10,11,9
		c) Mortality, percent, age specificity	11,5b,6a,6b,6c,6e	7,10,11,14,9
		d) Productivity	3,4,1	7,10,11,14,9
3.	DISTURBANCE	a) Determination of significant disturbance agents, distances and intensities		
		1. Wintering areas	10,5a,6b,6c,6d,1,2	1,3,4,10,12,13,14
		2. Migration stop overs	10,5a,6b,6c,6d,1,2	1,3,4,10,12,13,14
		3. Breeding areas	10,5a,6b,6c,6d,1,2	11,12,13,14,13,14
4.	FEEDING ECOLOGY	a) Distribution & abundance of prey/carrion	1,2,3,4,5	11,12,13,14
		b) Nutritive value of food	12	2,4,8,10,13
		c) Monitor pesticides of eggs, prey items	12,11	3,9,10,11,13,14

TABLE 9

METHODS AND JUSTIFICATIONS FOR BALD EAGLE INVESTIGATIVE RESEARCH NEEDS AND PRIORITIES IN MONTANA

Methods	Justifications
1. Data synthesis from other studies	1. Basic data need for management zones, artificial structure, human activity restrictions
2. Passive observation	2. I.D. of seasonal feeding/roosting areas critical for survival of recruits
3. Inventory/census flights	3. Determine priority of protection and mitigation activities
4. Ground surveys	4. Quantitative determination of potential habitat to meet recovery goals
5. Radio telemetry	5. Local and regional importance for maintenance of viable populations
a. tailmount radios	6. Determine origin of recruits, importance of migrants
b. solar powered back pack radios	7. I.D. age/sex specific mortality extent and causes
6. Marking studies	8. I.D. frequency and extent of periodic home range/habitat use shifts
a. banding (metal USFWS)	9. Establish health of population
b. colormarking	10. Establish minimums for survival, attainment of recovery goals, maintenance
c. colorbands (plastic)	11. I.D. anthropogenic population depressors
d. remige notching	12. I.D. reasons for population shifts
7. GEOSCAN[1] and discrimitate functional analysis[2]	13. Evaluate habitat changes
8. Adult/nestling blood sample electrophoresis	14. Avert population declines
9. Nestling feather sample nuetron activation analysis for trace element array	
10. Controlled, quantitave experiments on stable populations	
11. Carcass examination	
12. Laboratory analysis	

[1]A computer based program that evaluates geographic/habitat data to animal location data.
[2]Compares habitat characteristics of points of eagle use with points of nonuse.

— Fish habitat modification by other land uses and activities that might affect bald eagle prey availability.

— Fish eradication programs.

— Adjudication of water rights which could affect prey populations.

Opportunities to protect areas from conflicting uses should be explored and incorporated into land management plans. Examples include selective land withdrawals, special allocations and no surface occupancy stipulations. The cumulative effects of land uses over time should be considered when applying protective and compensative measures. Cooperation with private land management programs should be pursued.

Application of Interim Guidelines

The habitat management portion of the following guidelines should be applied to both occupied and unoccupied bald eagle habitat. Maintenance of suitable habitat will facilitate future occupancy. Guidelines need not be applied to unoccupied sites if the habitat has deteriorated to the point where nesting would be highly unlikely. Once recovery has been achieved, restrictions may be relaxed during years that adult eagles are not present. Management should ensure that human activity patterns do not develop to a point where (1) guidelines would be difficult to implement, or (2) would preclude future occupancy.

The failure of adult bald eagles to return to their nest, eggs or young after human interference is serious and unpredictable. Because of this unpredictability, precaution should always be taken in the vicinity of any nest or potential nesting territory.

Nesting chronology for bald eagles can be divided into five phases. Table 10 summarizes each phase, the sensitivity to disturbance and the average date for when the phase is likely to occur. The average date will serve most purposes, but variation in these dates may occur from year to year or with behavioral variability among pairs.

Territory Areas and Management Guidelines

The interim management guidelines are organized according to three areas which include habitat progressively farther from the nest site: (1) nest site area, 1/4 mi. (400 m) radius from the nest; (2) primary use area, 1/4 mi. (400 m) to 1/2 mi. (800 m) radius from the nest; and (3) home range, 1/2 mi.(800 m) to 2½ mi. (4 Km) radius from the nest (Figure 4). The configuration of these areas will probably change from set distance circles to specific area delineations once intensive study of bald eagle activity patterns, key sites, and pair behavior are incorporated into site specific management plans (Figure 5). The local topographic and vegetative characteristics must also be a consideration in site specific management area delineations.

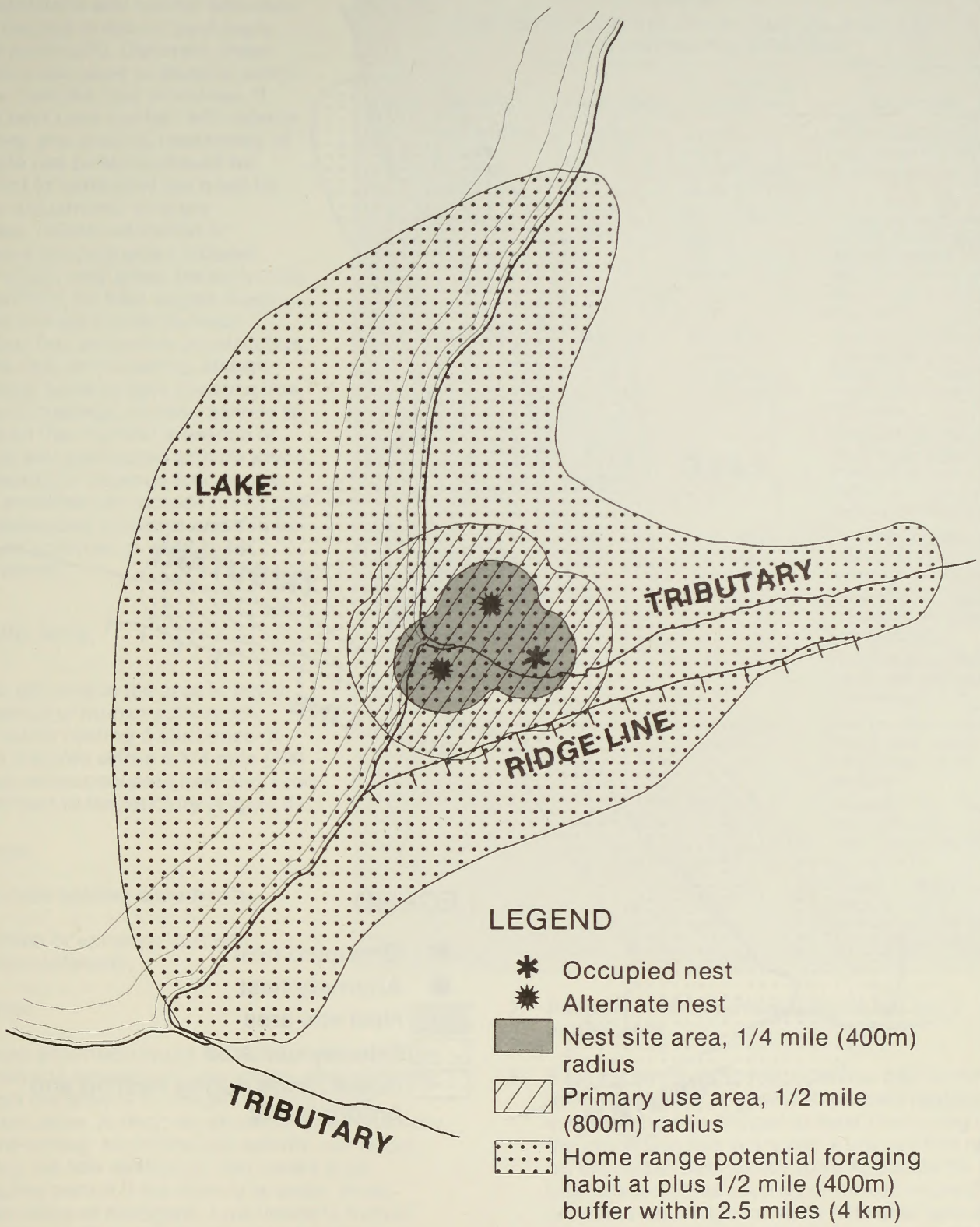
LAKE
TRIBUTARY
RIDGE LINE
TRIBUTARY
LEGEND
Occupied nest
Alternate nest
Nest site area, 1/4 mile (400m) radius
Primary use area, 1/2 mile (800m) radius
Home range potential foraging habit at plus 1/2 mile (400m) buffer within 2.5 miles (4 km)

Figure 4 An example of areas recommended for interim management of Bald Eagle breeding territories in Montana.

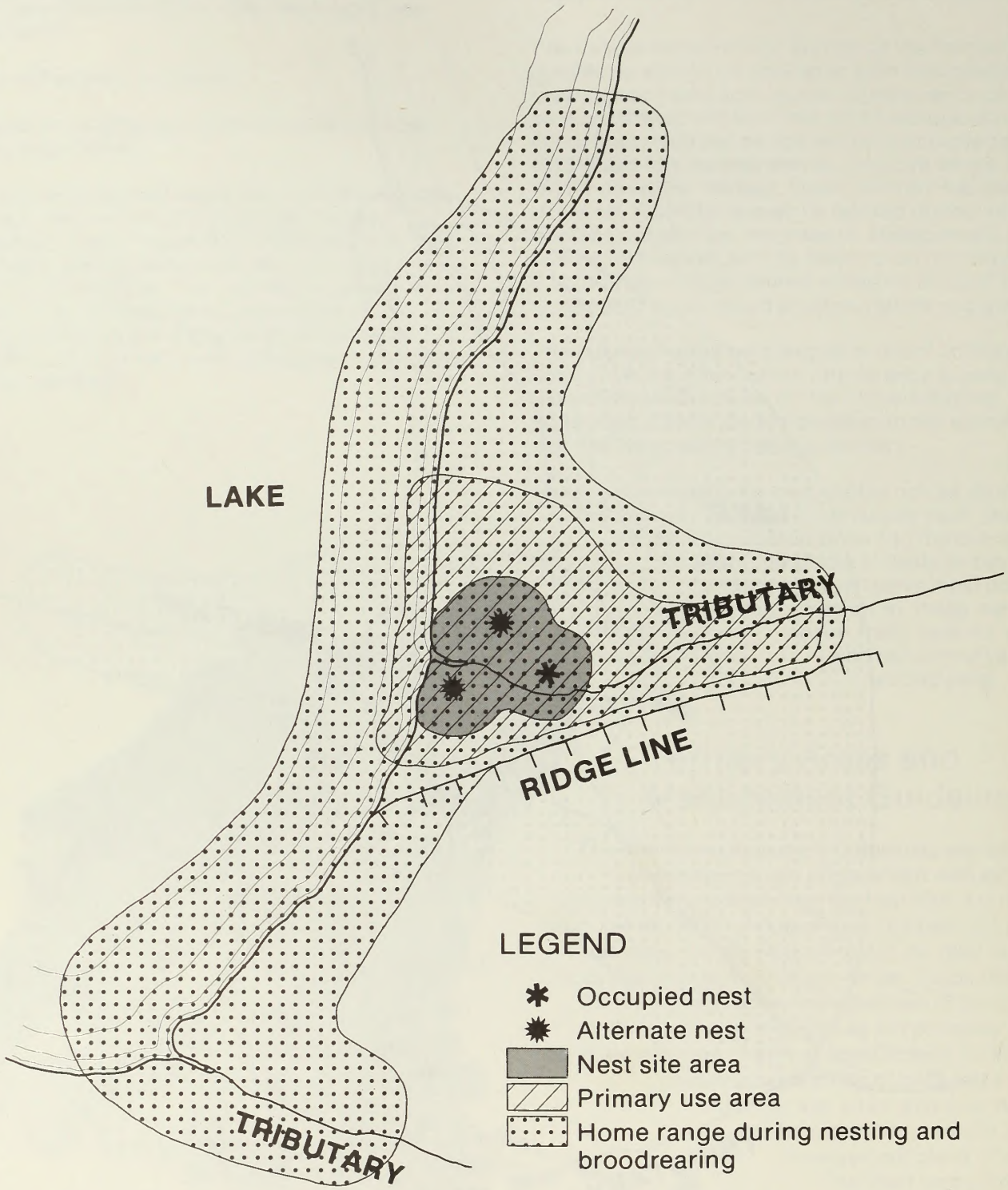

Figure 5 An example of site specific management plan adjustments to interim management guidelines (Fig. 4) after determining actual Bald Eagle use in Montana.

The following guidelines identify activity level restrictions and habitat alteration criteria needed to assure bald eagle territory continuity. Generally these restrictions decrease in severity as the distance from the nest increases. If existing land uses conflict with interim guidelines, site specific monitoring of bald eagle use patterns should be completed to determine the need for land use adjustment. In these guidelines, habitat alteration is considered as any human induced change which may affect the suitability of the territory for bald eagles. Such activities include timber harvest, prescribed fire, powerline construction, pesticide use, land clearing, stream channeling, levee or dam construction, or wetland drainage. Human activity is considered the physical presence of people or any associated activity which might disturb or displace bald eagles. Human activities can include motorized or non-motorized activities and can be short term activities or permanent developments.

TABLE 10

TIME AND SENSITIVITY OF NESTING BALD EAGLES TO DISTURBANCE IN MONTANA

Phase	Activity	Average Dates	Sensitivity To Disturbance	Comments
I	Nest building, includes courtship behavior	Feb 1 to May 15	Extremely sensitive period; most likely to desert.	Most critical time period manifested by nest abandonment.
II	Egg laying	Feb 1 to May 15	Extremely sensitive period; most likely to desert.	Human disturbance of even limited duration may cause desertion, not only of nest sites, but also of long established territories.
III	Incubation	Mar 1 to April 30	Extremely sensitive period; most likely to desert.	Nest site tenacity is weakest on new territories or when the birds establish their first territories.
				Flushed birds leave eggs unattended. Eggs are susceptible to cooling, loss of moisture, over heating and predation.
IV	Hatching and rearing young	May 1 to Aug 15	Moderately sensitive.	As hatching approaches most birds become tenacious to clutches.
				Generally uncommon to abandon a nest after young have hatched.
				First half of nestling period, young are most susceptible to elements.
V	Fledging	June 15 to Aug 15	Moderately sensitive.	Unattended nestlings may chill or overheat and are susceptible to predation.
				Nestlings may miss feedings which may affect overall health of young birds.
				Premature fledging, threat to young prematurely leaving nest due to disturbance.

Nest Site Area

The nest site area is the area in which the presence of human activity will usually cause nesting disturbance. It includes the area within a 1/4 mile (400 m) radius of the occupied nest and each alternate nest in the territory (Figure 4).

Objectives:

1. Eliminate nesting disturbance.
2. Maintain or enhance nest site habitat suitability.

Guidelines:

1. Human activities should not occur from initiation of nest site selection to one month after hatching, unless the activity is needed for bald eagle conservation. A short duration less than one hour, nonrecurring, nonmotorized activity can occur during the late nestling to two weeks post fledgling period if the activity is under direct supervision of biologists. Low intensity human activities such as dispersed recreation can occur during the non nesting period or when the territory is not occupied. Approval of higher intensity human activities during the non nesting season should be based on a site specific management plan.
2. Permanent developments should not be constructed.
3. Existing levels of human activities can continue if the territory has at least a 60 percent nesting success and has fledged at least five young during the preceding five years and a low conflict rating on the raptor nest survey form Appendix IV. Low intensity activities such as dispersed recreation can occur, but high intensity activities such as heavy equipment use, blasting, or concentrated recreation use should not occur during the nesting season. Higher intensity activities can occur during the non-nesting season if designed to minimize potential disturbance and avoid conflicts with bald eagle key use areas.

4. Only habitat alterations designed to maintain or enhance bald eagle nesting habitat should occur.

Primary Use Area

The primary use area identifies the habitat used over 75 percent of the time by a nesting pair. Delineation should consider both feeding and loafing areas. It includes the area 1/4 mile (400 m) to 1/2 mile (800 m) from the occupied nest and each alternate nest in the territory (Figure 4).

Objectives:

1. Eliminate nesting disturbance.

2. Minimize disturbance within the key use areas of the territory.

3. Maintain the integrity of the nesting territory.

4. Eliminate hazards within key use areas of the territory.

Guidelines:

1. Low intensity activities such as dispersed recreation can occur, but high intensity activities such as heavy equipment use, blasting, or concentrated recreation use should not occur during the nesting season. Higher intensity activities can occur during the non-nesting season if designed to minimize potential disturbance and avoid conflicts with bald eagle key use areas.

2. Habitat alterations should be designed and regulated to ensure that preferred nesting and feeding habitat characteristics are maintained.

3. Permanent developments that may increase human activity levels during the nesting season should not be constructed (i.e., activities which can not be seasonally restricted).

4. Structures that pose a hazard such as overhead utility lines should not be constructed. Existing mortality risks should be removed or modified.

5. Permanent developments should not be constructed.

If not, a site specific management plan should be completed to determine if restrictions on existing levels of activities are needed.

Home Range

The home range represents all areas used by the eagles during the nesting season. In the interim guidelines it includes all potential forging habitat within 2.5 mi. (4 km) from the center of the nest site areas. Areas not considered key habitat within this area can be excluded from the home range. However, the home range includes a 1/4 mi. (400 m) buffer along forging habitat where the home range has been reduced (Figure 5).

The total area encompassed, including the nest site and primary use area, should be considered as occupied nesting habitat in relation to the formal consultation procedures.

Objectives:

1. Maintain suitability of foraging habitat.

2. Minimize disturbance within key areas of the territory.

3. Minimize potential hazards.

4. Maintain integrity of the territory.

Guidelines:

1. Human activities, including permanent developments, should be designed and regulated to minimize disturbance and avoid conflicts with bald eagle key use areas.

2. General human activities should not reach a level where the cumulative effects decrease habitat suitability.

3. Habitat alterations should be designed to ensure that the prey base and important habitat components, such as perch trees or screening vegetation are maintained.

4. Pesticides should not be used in a manner which pose a hazard to bald eagles.

5. Structures which pose a hazard should be located and designed to minimize or avoid the risk to bald eagles.

SUMMARY OF TERRITORY ZONE GUIDELINES

Nest Site Area	*Primary Use Area*	*Home Range*
Human activities should not occur during the nesting season.	High intensity or loud human activities should not be allowed during the nesting season.	Human activities designed to minimize disturbance or conflicts with key habitats can occur
Only habitat alterations designed to maintain or improve nesting habitat are allowed, (cf. Table 10).	Habitat alterations which can be designed to maintain preferred nesting and feeding habitat characteristics can occur.	Habitat alterations designed to ensure maintenance of prey base and key habitat components can occur.
Permanent developments not allowed.	Permanent developments which can be seasonally restricted can occur.	Permanent developments designed to minimize disturbance or conflicts with key habitat can occur.
Structures that pose a hazard are not allowed.	Structures that pose a hazard are not allowed.	Structures that pose a hazard can occur if they are designed and/or located to minimize the risk to bald eagles.
Pesticides can only be used if they do not pose a hazard to bald eagles.	Pesticides can only be used if they do not pose a hazard to bald eagles.	Pesticides can only be used if they do not pose a hazard to bald eagles.

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APPENDIX I

United States Department of the Interior
FISH AND WILDLIFE SERVICE

MAILING ADDRESS:
Post Office Box 25486
Denver Federal Center
Denver, Colorado 80225

STREET LOCATION:
134 Union Blvd.
Lakewood, Colorado 80228

IN REPLY REFER TO:
FA/SE/FWS--Endangered
Species (6-RO-85-F-009)

AUG 15 1985

MEMORANDUM

To: Field Supervisor, Helena, Montana (SE)

From: ACTING Chief, Endangered Species

Subject: Montana Bald Eagle Management Plan--Section 7 Consultation

This responds to your request of June 24, 1985, for formal intra-Service Section 7 consultation regarding the proposed Montana Bald Eagle Management Plan (MBEMP). The U.S. Fish and Wildlife Service (FWS) is serving as the lead for all Federal agencies involved in the Montana Bald Eagle Working Group (MBEWG), which includes the National Park Service, Forest Service, Bureau of Land Management, Bureau of Indian Affairs, and FWS.

Prior to its listing in 1978 as an endangered species, little attention was given to the bald eagle (Haliaeetus leucocephalus) on a Statewide basis. In 1978, only 12 nesting territories were known in Montana. Due to both increase in population size and a greater emphasis on surveys, 63 current or historic territories are currently known. Forty-four of these were occupied in 1984, and nesting success was approximately 64 percent.

Since 1979, an annual mid-winter survey of bald eagles, initiated by the National Wildlife Federation, has provided quantitative information on the number and distribution of wintering bald eagles in Montana. Populations of 400 to 500 have been counted each year. Additionally, both eastern and western Montana are important routes for both spring and fall migrating eagles. The autumn concentration of as many as 600 eagle migrants at McDonald Creek in Glacier National Park is especially unique.

Despite the encouraging apparent increase in nesting populations, human-caused mortality of bald eagles continues to occur in Montana. Factors include shooting, accidental trapping, electrocution, powerline collisions, and poisoning. Poisons as a source of mortality have decreased in recent decades. DDT and its metabolites have also decreased in Montana in the last 10 years. This combination of reduced mortality and increased reproductive success is probably the basis for current population growth.

However, habitat alterations have increased over historic levels. This trend will undoubtedly continue, reducing the availability of suitable habitat for bald eagles in Montana. The primary sources of habitat loss or degradation are river impoundment, logging, subdivisions, and human recreation. Even though the bald eagle population appears to be increasing in Montana, the long-term carrying capacity may actually be decreasing. Positive steps will have to be taken to assure the security of bald eagle habitat in Montana.

The proposed MBEMP is intended to be an extension of the Pacific States Bald Eagle Recovery Plan (PSRP) in that it identifies potential problems for the Montana population and localizes management recommendations that are in only general form in the PSRP. It will implement programs to coordinate information exchange, research, and management of bald eagles in Montana and adjacent areas. The objectives of the MBEMP include: (1) providing landowners and resource managers with information on the biology of bald eagles to help conserve the species and its habitat, and (2) enhancing the status of the species by providing secure habitat for eagles and increasing population levels in specific geographic areas in the State. The MBEWG intends to manage habitat sufficient for a minimum of 140 nesting territories. A 71 percent occupancy rate is expected, resulting in an objective of 99 breeding pairs.

To accomplish these objectives, the MBEWG has developed management objectives and guidelines for both occupied and potential nesting habitat, as well as winter/migration habitat. Goals for properly monitoring the bald eagle population and reducing bald eagle mortality in Montana are identified in the MBEMP. Guidelines for identifying research needs and priorities, as well as increasing public information and education of eagle ecology are included in the plan. For all nest sites, interim management guidelines will be implemented until site-specific guidelines are developed through intensive study and evaluation.

Three other listed species may be affected by implementation of the MBEMP: the peregrine falcon (Falco peregrinus), grizzly bear (Ursus arctos horribilis), and the gray wolf (Canis lupus). However, it is expected that any effect from the plan will be indirectly beneficial through the protection of habitat and associated prey species.

It is my biological opinion that the proposed MBEMP is not likely to jeopardize the continue existence of the peregrine falcon, grizzly bear, or gray wolf and will promote the conservation of the bald eagle.

ACTING James L. Miller

Concur: John D Green
ARD, Federal Assistance

Concur:
Acting Regional Director, Region 6

APPENDIX II
SITE SPECIFIC TERRITORY MANAGEMENT PLAN

Standard Format

Introduction

Include any special background information as a basis for the management plan. Identify the source of information used to develop the plan and the extent of site specific bald eagle information available for this territory. Identify the agencies and administrative units responsible for the plan's implementation.

Territory Description

Include land ownership and land use patterns. Specifically identify all land owners included in the home range. Identify when and the type of habitat alterations. Include a summary of habitat characteristics of the territory that might be important for bald eagle management. Identify results of the nesting habitat model ratings. Include a copy of the nest record, macrohabitat and micro-habitat description forms.

History of Bald Eagle Use

Summarize what is known about bald eagle use in the territory. Include documented historical use, nesting chronology, nesting history, alternate nest use, key use area and pair behavior patterns. Include copies of nest survey forms in the appendix of this plan.

Potential Conflicts

Identify and discuss management problems and potential conflicts for bald eagles in this territory.

Management Areas

Describe the nest, primary use and home range areas for the territory, including a detailed map.

Management Direction

Identify specific management direction for the nest site, primary use and home range area.

Action Items

Identify what is needed for future management such as research, habitat improvement projects, land use coordination, land exchanges, easements or purchases.

References Cited

In addition to published information, include file data, personal communications, and other sources of information.

Recommended Steps for Developing Site-Specific Management Plans

Recommended Steps	Management Concerns
1. Document historical use of area by eagles.	a. Past nest and roosting sites b. Feeding areas c. Winter use
2. Document habitat conditions of historical breeding territories.	a. Other resource uses b. Vegetative succession c. Prey base d. Changes in waterways e. Pesticide use f. Urban development
3. Determine site-specific nesting chronology and productivity.	
4. Delineate territory boundaries based upon site-specific habitat use patterns.	a. Current nest and roosting sites b. Feeding areas by season c. Winter areas
5. Characterize existing and potential nest sites.	a. Territory and nest site measurements
6. Characterize pair behavior.	a. Response to disturbance
7. Evaluate prey availability.	a. Identify fish concentration areas and population trends b. Map big game winter ranges c. Map waterfowl habitat d. Seasonal availability of prey e. Provide site specific recommendations for protection and enhancement of prey habitat
8. Identify landowners and include them in all management considerations.	
9. Provide direction and coordination with appropriate resource managers or landowners to accommodate bald eagle needs.	a. Identify temporal limits on activities b. Spacial limits
10. Examine the silvics of trees within existing and potentialbreeding territories.	a. Nest trees b. Shading c. Perches d. Roosts
11. Plan and schedule silvicultural treatments if manipulation necessary to provide adequate tree size, growth type, and density.	a. Potential nest tree b. Stand thinning c. Stand regeneration d. Species preference or conversion
12. Provide for alternate stands should disease or fire eliminate the primary stand.	a. Protection of tree stands from fire and disease
13. Identify factors which influence productivity and attempt to reduce their limiting effect.	a. Quality of habitat
14. Inventory recreation use levels at sites within and adjacent to occupied and potential breeding territories.	a. Developed recreation sites, campgrounds special uses. b. Dispersed recreation, land based: landings and campsites. c. Dispersed recreation, water based: landings, campsites, boat dock, and boater use patterns.

15. Provide direction to recreation managers necessary for the protection of bald eagles.	a. Fishing and floating regulations b. Location of access and development c. Necessary closures
16. Identify existing and potential developments within breeding territories.	a. Subdivisions, developments, roads, and associated increases in human activities.
17. Identify special hazards.	a. Powerlines, and pesticides.
18. Review site specific nesting plans with MBEWG.	a. The working group will review plans for adequacy and interpretation of data. b. Management recommendations will be evaluated.
19. Priorities for selection.	a. High hazard rating from surveys b. Poor nesting success c. High potential conflict ratings. d. Any new activities in nest site and primary use areas.

Potential Hazard Rating

1. Unlikely that the nest or nest tree will be lost or become unsuitable. For example, nest is secure in a healthy ponderosa pine, no evidence of disease in the stand or understory is not overtopping the nest tree. Alternate nest trees are available in the nest stand.

2. It is likely that the nest or nest tree will be lost or become unsuitable in the foreseeable future. For example, nest in a dead ponderosa pine, nest stand diseased or a dense understory tree layer exists in the nest stand. Alternate nest trees are available in the nest stand.

3. Nest or nest tree is in immediate danger of being lost or becoming unsuitable. For example, inadequate support for nest, nest tree is rotten and nest tree being overtopped by understory trees. Alternate nest trees are not available.

Potential Conflict Rating

1. Activities that could impact the territory are not occurring now, nor are any planned.

2. Activities that could impact the territory are not occurring now, but are anticipated for the foreseeable future. Examples are subdivisions within one mile, road construction within 1/2 mile, timber harvest within 1/2 mile or a very accessible site.

3. Activities that would impact the territory are occurring or planned for the immediate future, e.g., subdivision within 1/2 mile, road construction within 1/4 mile or timber harvest within the nest stand.

Under comments, identify the potential hazard or conflict and include any management opportunities to resolve the hazard or conflict noted.

A space is provided for recording any additional observations or remarks that you feel might be important in the survey or management of this territory. Include comments about the suitability of the survey methods used. Please print your name and date the form. Include your mailing address so that the computer printout of the completed form can be sent to you for checking.

APPENDIX III
RAPTOR NEST RECORD

The raptor nest record is a form to establish a permanent record of nest locations. The form has been kept simple to facilitate use and is limited to general descriptive information about the nest. The objective is to include sufficient information so that someone unfamiliar with the nest can find it in the future.

The form is self explanatory, but the following may be helpful in filling it out in relation to bald eagles.

The territory name and number should be the official name and number designated by the bald eagle working group.

Record the name of the person who originally located the nest and the date it was first reported, if known.

Identify the nest location to the nearest quarter of a quarter section.

Record the first three digits of latitude and the first four digits of longitude for the southeast coordinates of the 10 minute block involved.

Record the eight digit hydrologic unit code from the USGS hydrologic unit map for the drainage involved.

Record the tree species the nest is in and if the tree is dead or alive.

Record position on slope using one of the following categories: drainage bottom, lower 1/3, mid-slope, upper 1/3, or ridge top.

Record land ownership, identify agency and administrative unit involved, e.g. Forest Service, Spotted Bear Ranger District, Flathead National Forest. If private, identify the land owner, such as Burlington Northern or Schroader Ranch.

Under the "Other" category, record how visible or easy it is to find the nest. Anything you feel is important can be recorded here, landmarks, tree condition, trails, and other information. Be very specific in your directions to the nest and use mileages to action points. Be sure that someone unfamiliar with the area could find the nest with your directions. Attach maps and photos.

Identify the name and scale of the USGS topoquad map attached to the form. On this map identify the nest location with an X, highlight the access route to the nest with a solid line for a road and dashed line for walking. Identify locations from which the attached photos were taken with an arrow toward the nest site.

Record the name of the person filling out the form and date it was completed.

Name

Date

Agency & Office

Raptor Nest Record

Species: _____

Territory name: _____

Territory/nest number: _____

Reported by and date: _____

Location: T _____ R _____ Section _____ 1/4 _____ 1/4 _____

State: _____ County: _____

Elevation: _____ Aspect: _____

Latilong: _____ Hydrologic unit: _____

Nest stratum: _____ Nest height: _____

Position on slope: _____ Nest condition: _____

Land ownership: _____

Directions to nest: _____

Other: _____

_____

_____

_____

Map (1:24000 USGS quad) and Photos

Photograph Showing Nest Site

Photograph Showing Nest

Prepared by: _____ Date: _____

APPENDIX IV
RAPTOR NEST SURVEY FORM

The raptor nest survey form is a two sided form designed to standardize raptor nesting data collection. Your ease of use, computer storage and data retrieval governed its format. Although completed for the annual Montana bald eagle nesting surveys, the form can be used for recording other raptor nesting data. The following instructions pertain to the bald eagle nesting survey. Individuals responsible for a nest survey will receive copies prior to each year's survey. Complete one form for each bald eagle nest. At the end of the survey period, make a copy for your records and send the original to your bald eagle working group representative.

Section I records general information, including the species and year of survey. The designated territory name and territory/nest number will be entered on the form before distribution.

Section II is a summary of survey results for computer storage and analysis. Working group compilers will complete this section from your survey results. PLEASE LEAVE SECTION II BLANK.

Section III is a table for recording your survey results. The objective is three nest checks per season, pre-egg laying, incubation, and fledging. Space is provided for including multiple nest checks completed during one nesting period. If insufficient space is available for your comments, use another sheet of paper and attach it to the form.

ALL NEST CHECKS: Record the date, name of observer and method of survey (ground, boat, fixed-wing, or helicopter). Identify nest condition destroyed (no longer present), poor (deteriorated and unusable), fair (usable), good (fully intact), or new (newly constructed nest).

PRE-EGG LAYING NESTING PERIOD: Under "Findings" record the number and age class (adult, sub-adult, or immature) of bald eagles in nest attendance. Under "Status" record either unoccupied (no adults in attendance), single adult or occupied (two adults in attendance). Under "Comments" record eagle behavior, distances of eagles to nest, presence of other species at the nest, evidence of nest repair and other important observations.

INCUBATION NESTING PERIOD: Under "Findings" record the number and age class of bald eagles in nest attendance. Identify yes or no, whether an adult bald eagle is in incubating position or if the adult is off the nest and whether eggs are present. Under "Status" record either active (yes under findings) or inactive (no under findings). Under "Comments" record eagle behavior, distances of eagles to nest, presence of other species at the nest, evidence of nest repair and any other observations you feel are important.

NESTLING NESTING PERIOD: Under "Findings" record the number and age class of bald eagles in nest attendance. Identify nestling number and age class. Under "Status" record either active (nestlings present) or unsuccessful (no nestlings). Under "Comments" record eagle behavior, distance of eagles to nest, presence of other species at nest and any other observations you feel are important.

FLEDGING NESTING PERIOD: Under "Findings" record the number and age class of the bald eagles in nest attendance. Identify the number of fledglings present by age class (Appendix Table 1). Under "Status" record either successful (number of fledglings present) or unsuccessful (no fledglings). Under "Comments" record eagle behavior, distances of eagles to nest, presence of other species at the nest and any other observations you feel are important.

Section IV: On the back of the form record known supplemental nesting information. Routine nesting surveys may not generate this type of data. If unknown leave blank, but approximate dates would be helpful. If banding occurred, record band numbers or other marks used.

Section V should be completed by all surveyors. Identify (Yes/No) if the nesting attempt failed. If yes, record date nesting period of failure and the reason for failure, if unknown, so note. Two ratings are requested. One for potential hazards associated with the nest, nest tree, or stand, and a second for potential conflicts that might impact the territory. The following examples might help you rate your territories.

Appendix Table 1: Nestling Age Class Codes

1.0 Downies	2.0 Feathers showing	2.9 Completely feathered
1.1 Small white downies	2.1 Mostly downy with some feathers	3.0 Fledged
1.2 Large gray downies	2.3 Downy head, but body feathers out	

RAPTOR NEST SURVEY FORM

19 ___

I. ID

Species: _____ Territory Name _____

Territory/Nest Number: _____ Historical Data ☐ Survey Results ☐

II. SURVEY SUMMARY

Survey:

☐ (1) Not Checked ☐ (2) Not Located ☐ (3) No Occupancy Check ☐ (4) No Activity Check ☐ (5) Unknown Outcome ☐ (6) Complete Survey

Status:

☐ (1) Unoccupied ☐ (2) Other Species ☐ (3) Single Adult ☐ (4) Occupied ☐ (5) Active ☐ (6) Unsuccessful ☐ (7) Successful

Nest Condition:

☐ (1) New ☐ (2) Good ☐ (3) Fair ☐ (4) Poor ☐ (5) Nest Destroyed, _____

Number of Fledglings:

Occupied _____ Active _____ Successful _____

III. SURVEY RESULTS

Nesting Period	Date Checked	Survey Method	Nest Condition	Findings	Status	Observer	Comments
Pre-Egg Laying: (3/1 - 3/31)							
Incubation: (4/1 - 4/15)							
Nestlings: (5/1 - 5/31)							
Fledging: (6/1 - 6/15)							

MBEWG (January 1983)

IV. SUPPLEMENTAL NESTING INFORMATION (if known)

Date of adult arrival: _____

Date of egg laying: _____

Date of hatching: _____

Date of fledging: _____

Date of adult dispersal: _____

Clutch size: _____

Date/Number of fledglings at dispersal: _____

Banding data: _____

V. NARRATIVE INFORMATION

Nesting attempt failed (Yes/No), date/nesting period of failure _____

and reason for failure: _____

_____

Potential hazard rating: (low) 1 2 3 (high)

Comments: _____

_____

_____

Potential conflict rating: (low) 1 2 3 (high)

Comments: _____

_____

_____

Observations or remarks: _____

_____

_____

Prepared by: _____ Date: _____

Mailing Address: _____

APPENDIX V
LEVEL I MACROHABITAT BALD EAGLE NEST SITE DESCRIPTION FORM

Definitions and Instructions

I. Information for this form comes from aerial photos and various maps. All points of reference are the nest site unless otherwise noted.

		Definition	Source
A.	1.	Province — as defined by Bailey (1976).	Subsection map
	2.	Subsection — land system inventory unit.	Subsection map (1:50,000)
	3.	Landtype — land system inventory unit.	Landtype map
	4.	Hydrologic unit — 10 digit number.	Hydrologic map of MT
	5.	Elevation — feet above sea level.	USGS topo quad
	6.	Aspect — compass degrees of the general slope the nest is on, faces. If flat so note.	USGS topo quad
	7.	Slope — the general slope in percent, the nest is on.	USGS topo quad
	8.	Position on Slope — circle most appropriate category.	USGS topo quad
	9.	Associated water body, (AWB) — identify the type (lake, reservoir, marsh, river) and size (surface acre or stream order) of the water body the nest is adjacent to.	USGS topo quad
	10.	Direction in degrees and distance in miles to AWB at closest point from the nest. If 1/4 to .10 mile identify in feet.	USGS topo quad
	11.	Elevation in feet the nest is above the AWB. Nest within line of sight of AWB?	USGS topo quad
	12.	Don't consider a vegetation barrier.	USGS topo quad
	13.	Direction in degrees and distance in miles to closest, larger than 4th order stream.	USGS topo quad
	14.	Total greater than 4th order stream miles within a 3-mile radius of the nest.	USGS topo quad
	15.	Direction in degrees and distance inclosest open water.	USGS topo quad
	16.	Total lake/reservoir shoreline miles within a 3-mile radius of the nest.	USGS topo quad
B.	1.	Potential vegetation (Pfister, 1975)	Habitat type map
	2.	Existing vegetation.	Timber type or vegetation map for area
	3.	Vegetation defined by agency data base.	Agency data base
	4.	Tree canopy closure at nest.	Aerial photo, PI type or stand exam
	5.	Size in acres of the homogeneous vegetation unit the nest is within.	Aerial photo or stand exam
	6.	General habitat composition to nearest 10%, if less than 10% use 0, 1%, or 5% categories.	Aerial photo
	7.	Record the number of times a change in habitat occurs (listed in B.6. above). Record for each direction, North, South East, or West from the nest.	Aerial photo
	8.	Direction in degrees and distance in miles to nearest habitat edge from the nest.	Aerial photo
C.		Three mile maximum distance for analysis.	
	1.	For each transportation route and elevation category listed within topographic line-of-sight of the nest. Identify distance to tenths of a mile at the closest point to the nest. Use road categories as defined on map legend.	USGS topo quad, BLM or general forest map
	2.	Road density, number of miles of each of the four road types within 1 mile and 3 mile radius of nest.	USGS topo quad, BLM or general forest map
	3.	Same as C.1. Sites are defined on map legend.	USGS topo quad, BLM or general forest map
	4.	Number of residences within 1 mile and 3 mile radius of nest.	General forest or BLM map

5.	Percent calculation of amount of AWB shoreline with human developments. If AWB is less than 6 shoreline miles in extent, use total shoreline.	USGS topo quad, BLM or general forest map
6.	Amount of recreation visitor days (RVD's) by month.	Recreation data base
7.	Differentiate between clearcut and partial cuts in calculations.	Aerial photo timber data base
D.		
1. and 2.	Differentiate between ownership	General forest or BLM map
3.	Special management areas include wilderness, proposed wilderness, wilderness study areas, research natural areas, wild and scenic rivers etc.	General forest or BLM map or agency files
4.	If stand exam data is available for nest, get a printout.	Timber data base
5.	Calculate percent of area within 1 mile and 3 mile radius of nest in all categories of private land.	General forest or BLM map
6.	If aquatic/fish data is available for AWB, get a printout.	Inter-agency stream data base
E.		
1. and 2.	Distance in miles	Bald Eagle Working Group
3.	Documentation of a previous nest that no longer exists. Analyze in time sequence.	Local biologist
4.	Distance in miles	Local biologist
5.	Document anything unique about the territory. Any concentrated food sources within 3 miles of nest? (e.g. spawning areas, big game winter range.)	Local biologist

Name of recorder: _____

Date: _____

Agency: _____

Office: _____

LEVEL I Macrohabitat Bald Eagle Nest Site Description Form

Territory name: _____

Territory/nest number: _____

A. Physical/topography

1. Province: _____
2. Subsection: _____ 3. Landtype: _____
4. Hydrologic unit: _____ 5. Elevation: _____
6. Aspect: _____ 7. Slope: _____
8. Position on slope: flat ____ ridge top ____ upper third ____ mid-slope ____ lower third ____
9. Type and size of associated water body (AWB): _____
10. Direction and distance to AWB: _____
11. Elevation above AWB: _____
12. Nest within topographic line-of-sight of AWB: YES ____ NO ____
13. Direction and distance to greater than 4th order stream: _____
14. Greater than 4th order stream miles within 3-mile radius of nest: _____
15. Direction and distance to lake or reservoir: _____
16. Lake or reservoir shoreline miles within 3-mile radius of nest: _____

B. Habitat

1. Habitat type (Phister 1975): _____
2. Timber/cover type: _____
3. PI type: _____ 4. Canopy closure: _____
5. Size of nest stand: _____
6. Habitat composition within 3-mile radius of nest: _____

a. open water	_____ %	g. deciduous	_____ %
b. urban	_____ %	h. open conifer (less than 70% closure)	_____ %
c. cropland	_____ %		
d. riparian	_____ %	i. dense conifer (greater than 70% closure)	_____ %
e. grassland	_____ %		
f. shrubland	_____ %	j. other	_____ %

7. Number of habitat turnovers intersected along four, three mile transect lines extending from nest: _____
   a. north _____ b. south _____ c. east _____ d. west _____
8. Direction and distance from nest to nearest edge, identify contrasting habitat: _____

C. Potential disturbances

1. Distance to transportation route:

	Below nest elevation	Even with	Above nest elevation
a. major highway			
b. primary road			
c. secondary road			
d. primitive road			
e. railroad			
f. trail			
g. high voltage power line			

2. Road density within:

	Major highway	Primary road	Secondary road	Primitive road
a. 1 mile radius of nest				
b. 3 mile radius of nest:				

3. Distance to human development:

	Below nest elevation	Even	Above nest elevation
a. residence	_____	_____	_____
b. recreation site	_____	_____	_____
c. other	_____	_____	_____

4. Number of residences within:
   a. 1 mile radius of nest: _____
   b. 3 mile radius of nest: _____
5. Percent of AWB shoreline that is developed:
   a. 1 mile of shoreline on either side of a nearest distance line from nest to shoreline: _____
   b. as above except 3 miles of shoreline: _____
6. Amount and season of recreation use of AWB:

   1 2 3 4 5 6 7 8 9 10 11 12

   Does power boating/water skiing occur? YES _____ NO _____
7. Timber harvest activities:
   a. nest site cutover: YES _____ NO _____
      if yes, what type of cut: _____
   b. within nest stand, but not nest site: YES _____ NO _____
      if yes, type of cut and distance: _____
      if yes, percent of nest stand cutover: _____
   c. within 1/4 mile: YES _____ NO _____
      if yes, percent of area cut over by type of cut: _____
   d. 1/4 to 1/2 mile: YES _____ NO _____
      if yes, percent of area cut over by type of cut: _____

D. Land Status
1. Land ownership: _____
2. If non-public land:
   a. is it within agency boundary: YES _____ NO _____
   b. distance to agency land: _____
   c. distance to federal mineral: _____
3. If agency land, is it within special management area: YES _____ NO _____
   If yes, which one: _____
   If no, agency allocation: _____
4. If agency land:
   a. compartment, grazing allotment, stand number: _____
   b. stand exam data available: YES _____ NO _____
   c. territory management plan complete: YES _____ NO _____
5. Percent of area in private land:
   a. 1 mile radius of nest: _____
   b. 3 mile radius of nest: _____
6. Is aquatic/fish data available for AWB: YES _____ NO _____

E. Territory
1. Distance to nearest occupied bald eagle territory:
   a. straight line: _____
   b. shoreline: _____
2. Alternate nest(s) present in territory: YES _____ NO _____
   If yes, direction, distance and position on slope from this nest: _____
3. Documented nest turnover in territory: YES _____ NO _____
   If yes, direction, distance and position on slope from this nest: _____
4. Any other raptor or heron nests within 3 mile radius: YES _____ NO _____ unknown _____
   If yes, distance by species: _____
5. Comments: _____

APPENDIX VI
PROCEDURES FOR HANDLING EAGLE MORTALITIES

1. Photograph if possible, and record the following information (at a minimum) and any other pertinent information that would be valuable.

   SPECIES _____ DATE FOUND _____

   AGE AND SEX _____

   LOCATION (LEGAL DESCRIPTION, DIRECTION AND DISTANCE TO NEAREST TOWN, HIGHWAY NUMBER, ELECTRIC UTILITY POLE NUMBER, COUNTY AND STATE)

   LAND STATUS: PRIVATE _____ STATE _____ FEDERAL _____

   OWNER IF PRIVATE OR MANAGER IF AGENCY LAND _____

   ADDRESS _____

   PHONE NUMBER _____

   SUSPECTED CAUSE OF DEATH OR INJURY _____

   NAME, ADDRESS, AND PHONE NUMBER OF FINDER _____

   _____

   NAME _____ TITLE _____

2. Retrieve the specimen, attach above information and freeze as soon as possible.

3. Contact the nearest FWS special agent as soon as possible and make arrangements to get the bird to him. If a special agent cannot be reached, the nearest state game warden should be contacted. If these individuals are unavailable, the report should be made to the FWS endangered species field office in Helena or nearest MDFWP office. The special agent will be responsible for submitting dead eagles to the national wildlife health laboratory for postmortem examinations.

APPENDIX VII

BIBLIOGRAPHY OF THE BALD EAGLE IN MONTANA
(Haliaeetus leucocephalus)

Prepared by Robin Magaddino, Wildlife Services
2100 Swan Highway, Bigfork Montana 59911
September 1985

The Bibliography

This bibliography includes citations of published and unpublished bald eagle literature in Montana. These citations are listed in alphabetical order by senior author or agency. Much localized bald eagle information included in BLM, FWS, USFS, and BIA documents has not been published elsewhere.

Sources of Bald Eagle Information

Between 1983 and 1985, the MBEWG collected bald eagle observations from individuals and agencies throughout the state. Completed observation cards supplied information on time of day, age, number of eagles, location, habitat and activity. Combinations of these data in narrative, graphic or map form will be available from the working group. Names and addresses of working group members are listed at the end of this report.

The U.S. Fish & Wildlife Service prepares inhouse documents which contain bald eagle information, at each office. They have not been cited separately within the bibliography but, collectively they are the midwinter waterfowl inventory, a biological survey conducted prior to the purchase of a refuge, refuge annual narrative report, refuge master plan, refuge and wetlands management plan, refuge bird list, refuge management information system quarterly report for raptorial birds, construction project environmental assessment and files on raptor nests, raptor observations, endangered species and raptor surveys.

Glacier National Park has a wildlife observation card system dating back to the 1950's. The Nature Conservancy conducts biological inventories of land areas they have acquired. All Audubon chapters within the state conduct Christmas bird counts, which often include sightings of bald eagles. These counts are published annually in "*American Birds*". The BLM maintains a raptor information system. Several other bibliographies are listed in this document.

Acknowledgements

Many persons contributed bald eagle citations which are contained herein. I especially wish to thank Kristi Dubois, Jon Swenson, Larry Thompson, and a host of federal employees for the generous gift of their time. The editorial comments of Al Harmata were very helpful.

Extensions of Abbreviations

BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
DNRC	Department of Natural Resources and Conservation
FWS	Fish and Wildlife Service
MDFWP	Montana Department of Fish, Wildlife and Parks
NF	National Forest
NPS	National Park Service
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	United States Forest Service

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APPENDIX VIII

NESTING VARIABLES SELECTED BY BALD EAGLES IN MONTANA

Taken From Montana Bald Eagle Nesting Habitat, A Macro-Habitat Description by Wright and Escano 1986, Table 35

Variable	Mean	SD	Min.	50%	75%	90%	max.
snowfall	100.6 in.	63	<50 in.	<100 in.	< 200 in.	<300 in.	<300 in.
aspect	10 deg.	—	—	<45 >300	<60 >350	<70 >340	—
slope	17%	20%	0%	<10%	<30%	<40%	64%
position on slope	—	—	flat	lower 1/3	lower 1/2	below ridge top	ridge top
AWB type	—	—	—	lakes	lake & res.	lake, res. and river	
stillwater AWB size	—	—	41 ac.	>1000 ac.	>300 ac.	>100 ac.	126000 ac.
running AWB size	all nest sites associated with running AWB are on rivers greater than fourth order in size						
distance to AWB	1027 ft	1216	1 ft.	<1000 ft.	<1500 ft.	<2000 ft.	5280 ft.
elevation above AWB	101 ft.	129	4 ft.	<56 ft.	<140 ft.	< 260 ft.	567 ft.
line-of-sight		all nest sites were within topographic line-of-sight of AWB					
equatic shoreline	11.3 mi.	5.1	1.5 mi.	>10 mi.	>7 mi.	>6 mi.	26 mi.
distance to major trib.	1.2 mi.	1.15	.25 mi.	<.75 mi.	<1.5 mi.	< 3.5 mi.	4 mi.
canopy closure	54%	21%	1%	<60%	<75%	< 80%	90%
stand size	49 ac.	47	3 ac.	>30 ac.	>20 ac.	>5 ac.	225 ac.
distance to edge	335 ft.	269	1 ft.	<225 ft.	<425 ft.	< 550 ft.	999 ft.
distance to primitive road	1.23 mi.	1.3	.02 mi.	>.4 mi.	>.15 mi.	>.05 mi.	3 mi.
distance to other roads	1.99 mi.	1.2	.2 mi.	>2.75 mi.	>.5 mi.	>.2 mi.	3 mi.
distance to point activity	1.33 mi.	1.0	.1 mi.	>1.0 mi.	>.3 mi.	>.13 mi.	3 mi.
miles of other roads (3 mi)	17.85 mi.	11.5	1 mi.	<17 mi.	< 25 mi.	<34 mi.	52 mi.
number of perm structures (3 mi.)	30	58	0	<12	< 38	< 70	300
% shore (1 mi) development	1.95%	5.9%	0%	equal 0%	<1%	< 5%	35%
% private land (3 mi.)	44%	34%	0%	>35%	>10%	>0%	99%
nearest neighbor	9.2 mi.	7.5	2 mi.	<6 mi.	<10 mi.	<20 mi.	40 mi.

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